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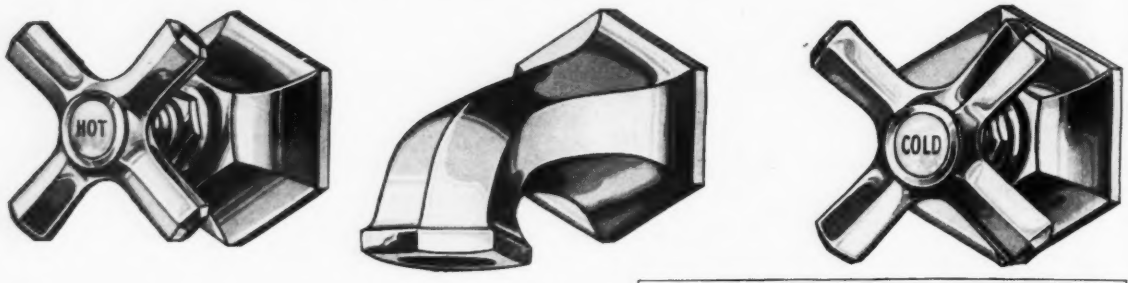
DOMESTIC ENGINEERING

The Plumbing and Heating Weekly

Ventilating the Holland Tunnel

Showing the fresh air duct below the tunnel roadway and the exhaust air duct above.

DECEMBER 24, 1927



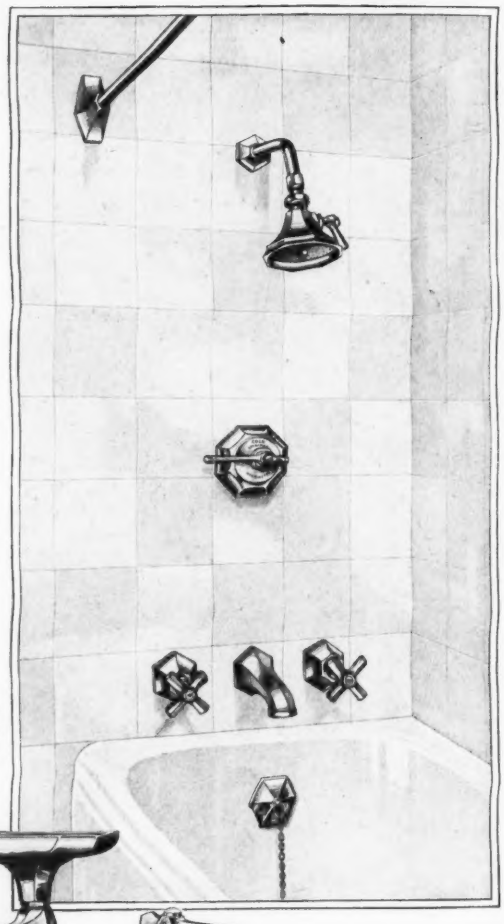
New!

Massive, graceful designs in showers and fixtures made possible by

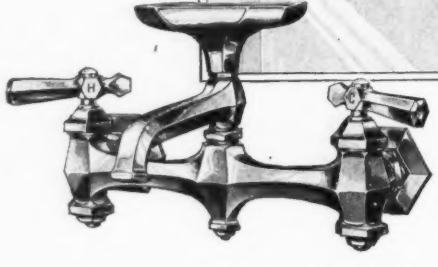
SPEAKMAN CHROMIUM PLATE

The Speakman Artline

THESE new showers and fixtures are octagon and hexagon shaped. They are all metal—handles and escutcheons, and are given a rich, permanent silver-platinum appearance by Speakman Chromium Plate, which will never tarnish and which requires wiping off only with a damp or dry cloth.



K4017—Artline Mixometer Shower over the Dupont Tub Filler. Valves have renewable high seats, swivel discs and encased washers.



K5512—The new Artline Sink Fixture. Has integral stops, broached spindles and metal soap dish on a post.

We have a folder on the new Speakman Artline
Copy will be sent upon request

SPEAKMAN COMPANY
WILMINGTON, DELAWARE

SPEAKMAN SHOWERS *and* FIXTURES

"Safe to build in the wall"

VOGEL *Frost Proof Closet*
No. 1

Decorate Your Tree With Dollars

and let Jovo be your Santa

There is one sure way of being able to celebrate a Merry Christmas *every* year.

Keep scattering Christmas Cheer all the year by selling the VOGEL Line of Frost Proof Closets and Hydrants. *And don't forget — every customer you* sell a VOGEL Hydrant or Closet to will boost your business and your reputation so much that decorating your tree with dollars won't sound so foolish after all.

To sell VOGEL Products you have to investigate them first — write us.

Jovo

Jos. A. Vogel Co.

Wilmington, Del. **St. Louis, Mo.**

VOGEL PATENTED

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More Than 19,500 Copies of This Issue Are Being Printed and Distributed

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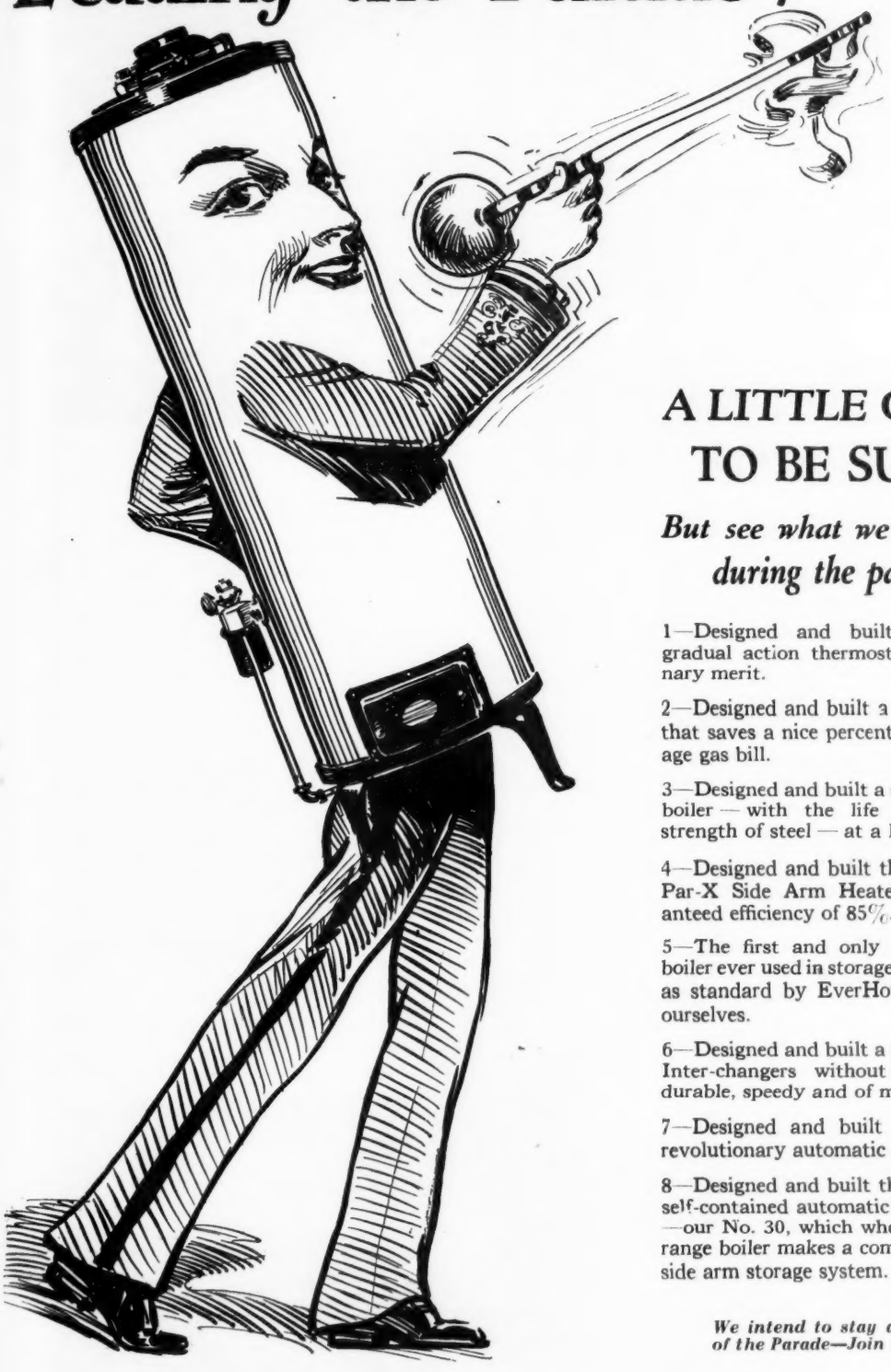
Leading the Parade!



A LITTLE COCKY TO BE SURE—

But see what we have done during the past year

1—Designed and built a new rapid gradual action thermostat of extraordinary merit.

2—Designed and built a leakage by-pass that saves a nice percentage of the average gas bill.

3—Designed and built a steel clad copper boiler — with the life of copper and strength of steel — at a low price.

4—Designed and built the revolutionary Par-X Side Arm Heater with a guaranteed efficiency of 85%.

5—The first and only 500 pound test boiler ever used in storage heaters adopted as standard by EverHot. We make it ourselves.

6—Designed and built a new line of Heat Inter-changers without coils — simple, durable, speedy and of moderate price.

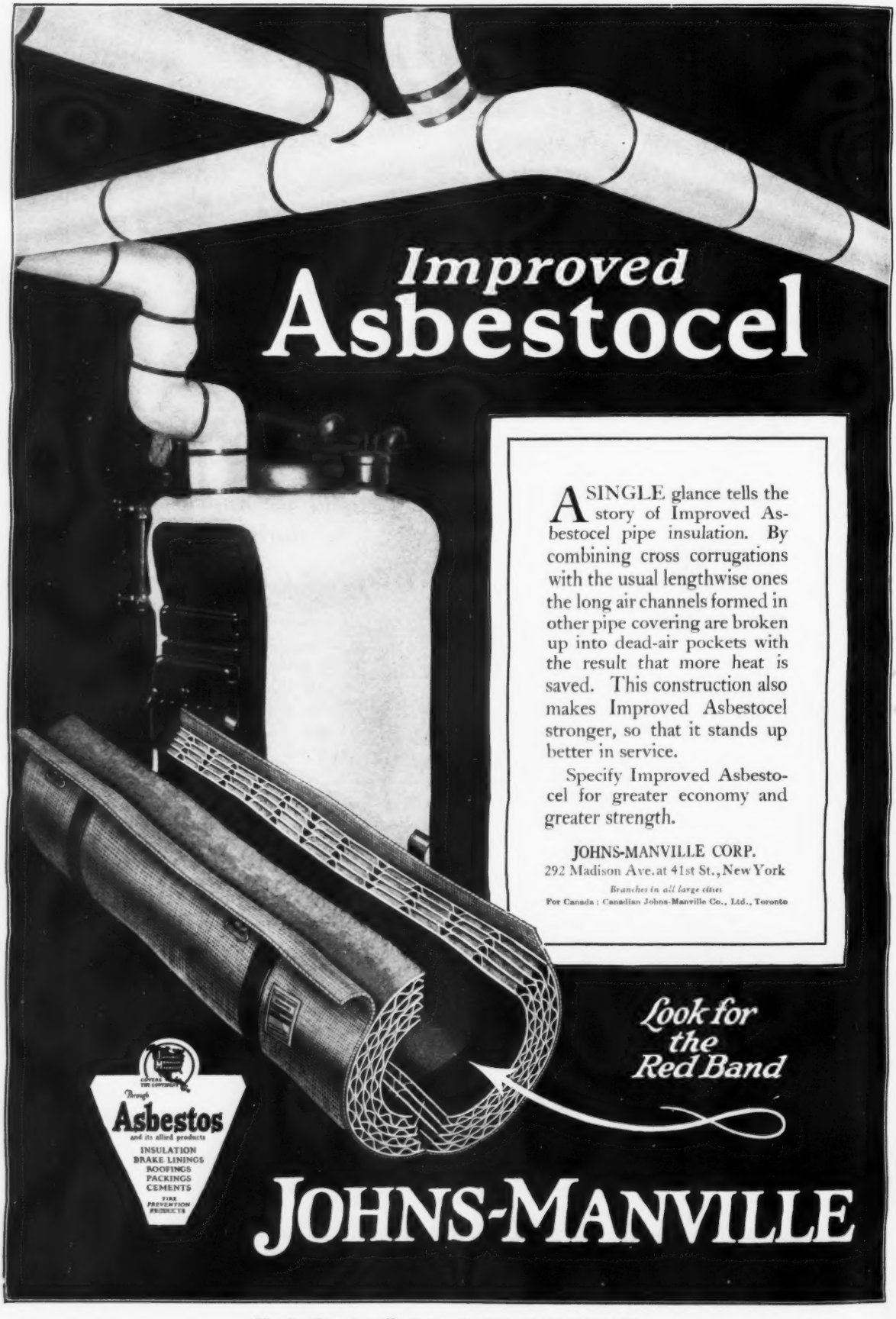
7—Designed and built a new, simple, revolutionary automatic pilot control.

8—Designed and built the first and only self-contained automatic side arm heater —our No. 30, which when attached to a range boiler makes a complete automatic side arm storage system.

We intend to stay at the head of the Parade—Join up with us.

EverHot Heater Company

5211 Wesson Avenue :: Detroit, Michigan


Improved
Asbestocel
A SINGLE glance tells the story of Improved Asbestocel pipe insulation. By combining cross corrugations with the usual lengthwise ones the long air channels formed in other pipe covering are broken up into dead-air pockets with the result that more heat is saved. This construction also makes Improved Asbestocel stronger, so that it stands up better in service.
Specify Improved Asbestocel for greater economy and greater strength.
JOHNS-MANVILLE CORP.
292 Madison Ave. at 41st St., New York
Branches in all large cities
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Look for the Red Band
Through Asbestos and its allied products
INSULATION
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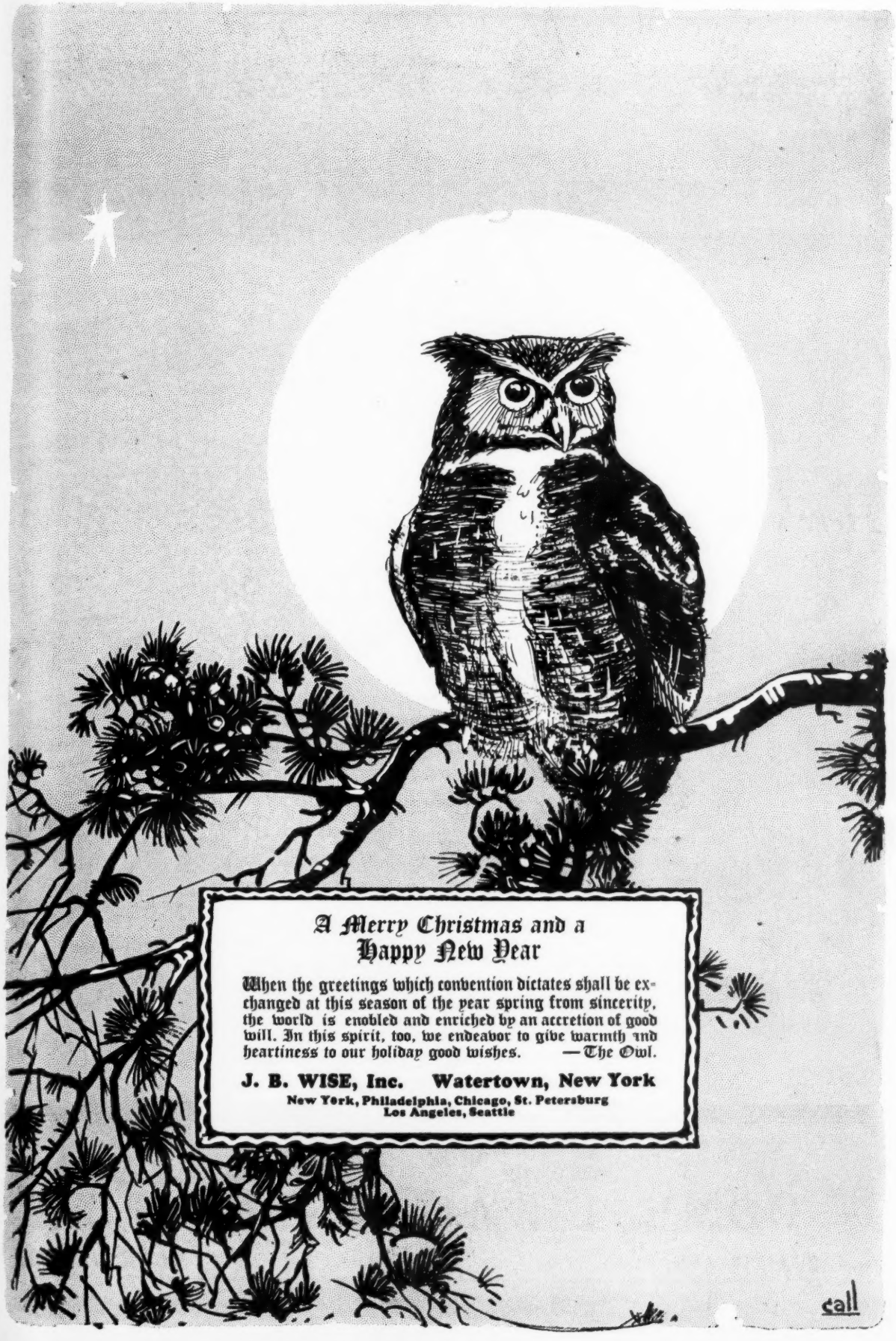
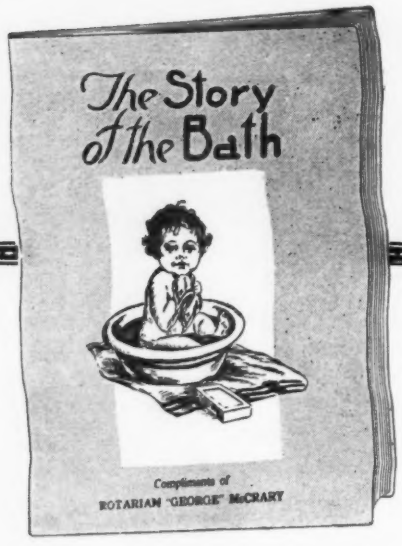

A Merry Christmas and a
Happy New Year
When the greetings which convention dictates shall be exchanged at this season of the year spring from sincerity, the world is enobled and enriched by an accretion of good will. In this spirit, too, we endeavor to give warmth and heartiness to our holiday good wishes. —The Owl.
J. B. WISE, Inc. Watertown, New York
New York, Philadelphia, Chicago, St. Petersburg
Los Angeles, Seattle
call



Here's the way "Rotarian George McCrary" gave

THE STORY OF THE BATH

*to Birmingham Rotarians**

WITH his compliments, "Rotarian George McCrary", of Birmingham, Ala., gave to his fellow Rotarians a copy of this little booklet which has done so much to educate the public as to the vital importance of the plumbing industry. If you want to put your industry on the map with your fellow Rotarians, Kiwanis, Lions, Boosters, etc., arrange to distribute "The Story of the Bath" at one of your luncheons. It will be inexpensive—and will yield splendid publicity.

** Paul Broome, Bradley Beach, N. J., and Ben Collier, Danville, Ill. have given their fellow Rotarians a treat.*

"Kiwanis" A. B. Hunt, of Williamsport, Pa., has followed suit. So has "Kiwanis" Ernest Demi of Philadelphia, Pa. So has "Kiwanis" Bill Blottman, Williamson, W. Va

Ask for a free copy of "The Story of the Bath" and you'll see why Mr. McCrary gave it out

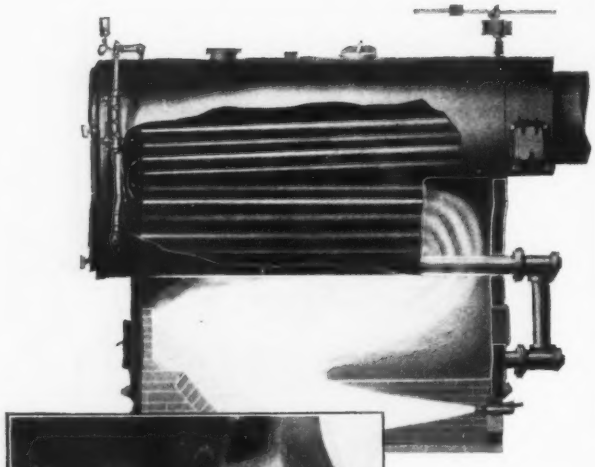
DOMESTIC ENGINEERING

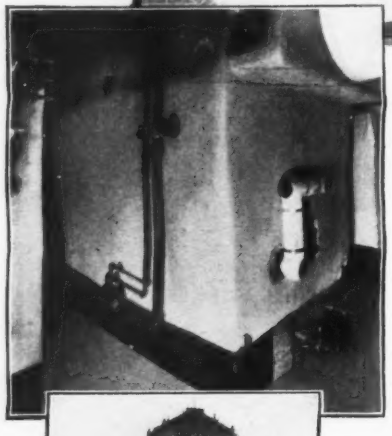
1900 PRAIRIE AVE. :: :: :: CHICAGO, ILL.

COHOES
Genuine Wrought Iron Pipe is more than a description. The word *genuine* in connection with Iron Pipe means that the manufacture is based upon the original and *only* known process that insures the material against corrosion and rust.
Cohoes Genuine Wrought Iron Pipe has never deviated from the formula of the founder. When Cohoes pipe is installed—architects, contractors, plumbing engineers—know that silently but surely Cohoes will do its work more efficiently for the life of the building.
Our *Hand Book* of Pipe facts is an authoritative manual on every subject of Genuine Wrought Iron Pipe. Sizes, lengths, weights, tests—all catalogued handily for your reference. We'll be glad to send you a copy.
940 Park Avenue, N. Y.
George & Edward Blum
Architects
Plumbing Contractors
Guaranteed Plumbing & Heating Corp.
COHOES ROLLING MILL CO.
COHOES, NEW YORK

The Pacific rear-firing principle for oil burning is fundamentally sound

This Operating Test Proved It





Mark Hopkins Hotel, San Francisco. Geo. D. Smith, Managing Director. Weeks & Day, Architects, Leland & Haley, Mechanical Engineers. Heated by two No. 824 14,000 sq. ft. Pacific rear oil-fired boilers, installed by Knittle Bros.

1. *Efficiency* — ranged from 83.05% at 82.8% of rating to 76.91% at 152.4% of rating.

2. *Overload Capacity* — boiler developed 152.4% of rating with *high efficiency* and no priming.

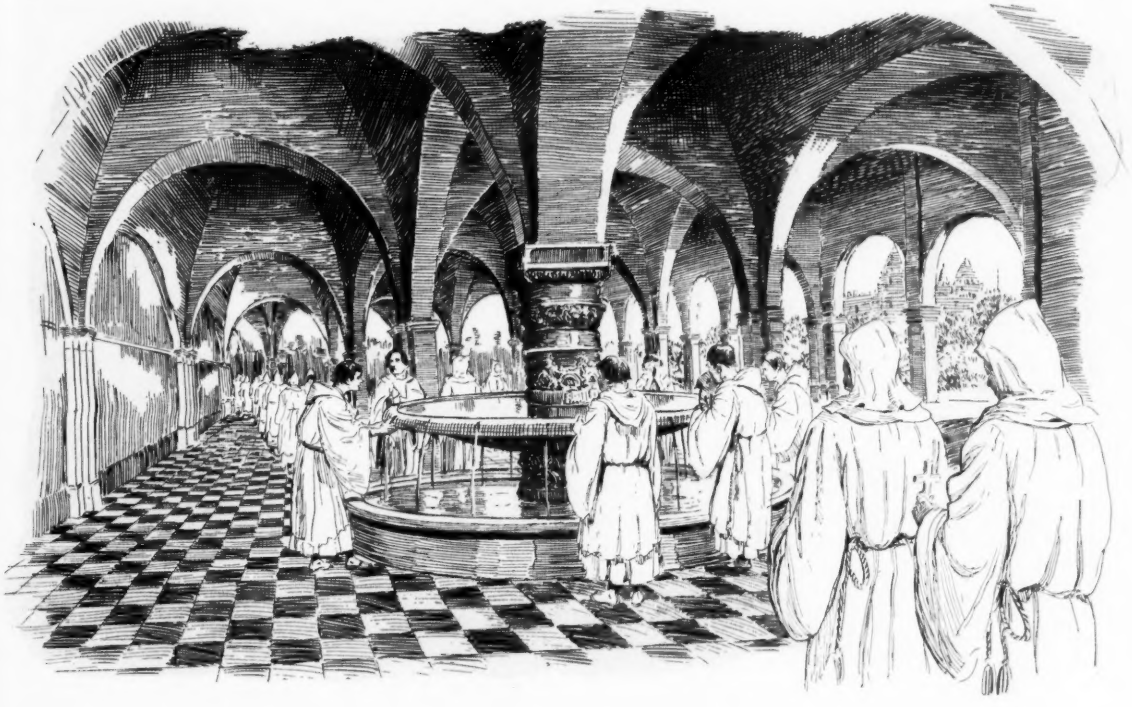
3. *Dry Steam* — only 0.93% water in separator box at 152.4% of rating.

4. *Low Flue Gas Temperature* —only 603° F. at 152.4% of rating.

One actual operating test by disinterested engineers of standing, is worth any number of factory or laboratory tests. The much-discussed test by Leland & Haley on the Pacific Boilers installed in the Mark Hopkins Hotel, San Francisco, is a case in point. It proves conclusively that the principle of four-time fire travel, found in no other type of boiler, gives most satisfactory results, by whatever standard you measure the success of the installation. Gases travel twice the length of the combustion chamber before entering the lower bank of tubes, then twice the length of the boiler through the tubes. Write for booklet containing complete data on this notable test of Pacific rear oil-fired boilers.

PACIFIC
STEEL HEATING BOILERS
Factories: WAUKEGAN, ILL., BRISTOL, PA.

One in a series of advertisements outlining the early development of plumbing ideas. A complete folio of this plumbing history will be sent on request.



Plumbing "Big Buildings" in the Middle Ages

BETWEEN the far away days of Imperial Rome and those which lie closer to us—in the time when the wisdom of the ancients had passed away and our own days of light had not yet dawned—there lies a great black gulf in human history known as "The Dark Ages."

Only in the quiet monasteries far from the ignorance, superstitions, cruelties, and filth, typical of Europe in the middle ages, was dimly burning the light of knowledge and culture. It is surprising to note how many times history bears witness to the importance plumbing played in the religions of all times and countries.

In the Abbey of Fontenay, France, founded by St. Bernard in 1118, it was the custom of the good monks, garbed in their white frocks, to come to their ablutions in an orderly manner, marching in single file along the vaulted archways to the spacious fountain where fifteen could wash at one time, and after the ceremony filing out on the other side of the basin court. Probably many times in these old structures the monks themselves turned plumbers to install the beautiful richly carved lavatories and drinking fountains of marble, copper or lead, typical of the period.

As the thriving monasteries of the middle ages, serving as hospitals, hotels and schools, necessitated the use of plumbing devices, crude as they were, so in their modern prototypes sanitary laws have forced the adoption of adequate equipment such as Brass Pipe, Flush Valves and Tubular Plumbing Goods of enduring Brass.

The importance of good plumbing is an accepted fact. Public recognition of leadership among plumbers themselves, however, is dependent on the use of first class material such as "Bridgeport" produces.

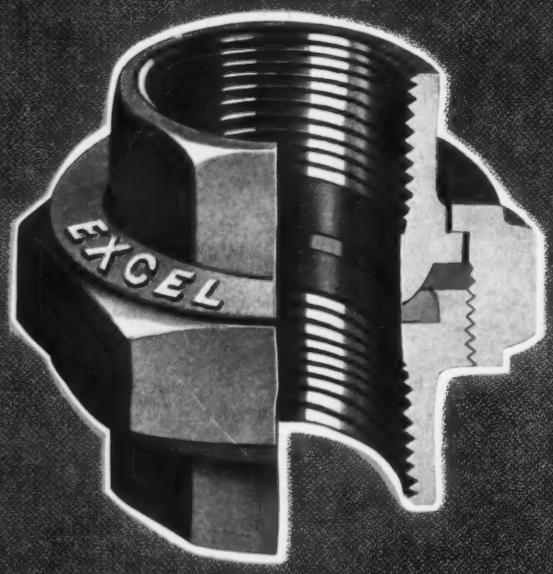
"Bridgeport" BRASS TRADE CO. MARK
Plumbing Goods
WE MAKE
Plumrite Brass Pipe
Traps & Tank Bends
Basin & Bath Supplies
Tank Supplies & Straight Wastes
Patented Sink Plugs
P.O. Plugs & Flanges
Flat Sink Strainers
Sink Connections
Connec'd Waste & Overflow
Flush Valves and Fittings

BRIDGEPORT BRASS

PIPE FITTINGS FLUSH VALVES TUBULAR PLUMBING GOODS

Plumrite Plumrite Plumrite Plumrite

Bridgeport Brass Co., Bridgeport, Conn. • New York • Philadelphia • Chicago • Detroit • Cleveland



THERE are three outstanding reasons why EXCEL Unions are favored for those installations where long life will be the chief demand.

The first is their strength which never lessens and which is built into every EXCEL by a special manufacturing process.

The second reason is the metals used in the manufacture of EXCEL Unions—the best air-refined malleable iron with the purest, solid brass seats.

The third reason is past performance. EXCELS have proven that they will "stay put."

EXCEL Unions meet Government Specifications No. 393 and are also listed as standard by the Underwriters' Laboratories.

PROVIDENCE FITTINGS CO., 7 Water St., Boston, Mass.

New York Office: 210 E. 45th St.

EXCEL

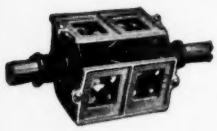
A Letter from Harry G. Nye

Nye Drop Forged Pipe Cutters

No. 1-A ⅛ to 1¼"..... $2.25 net
No. 2-A ¼ to 2"..... 3.00 net
No. 3-A 1 to 3"..... 5.00 net

Nye Saunders Pipe Cutters

No. 1..... $ 1.80 net
No. 2..... 2.70 net
No. 3..... 6.60 net
No 4..... 10.80 net
No. 5..... 16.80 net



Nye Four-Way Solid Die Stock

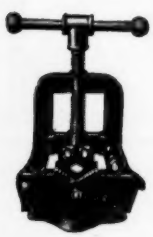
Complete with ⅜, ½, ¾ and 1-inch Dies.

Net Price..... $12.25

Nye Three-Way Armstrong Pattern Die Stock

Complete with ½, ¾ and 1-inch Dies.

Net Price..... $12.34



Nye Self-Locking Vise

No. 00 ⅛ to 2"..... $2.82 net
No. 10 ⅛ to 2½"..... 3.34 net
No. 20 ¼ to 3½"..... 5.00 net
No. 30 ½ to 4½"..... 7.33 net

December 24, 1927.

To the Plumbers and Steamfitters
of the U. S. A.

Friends:

Everybody wishes you a Merry Christmas, whether they care a darn whether you have one or not. But I mean it! And just to show you that I do, I bet you a dollar that you have a Merry Christmas!

Why shouldn't you? You are in a great business, in a great country. The nation is as full of prosperity as a log schoolhouse is of itch. Almost anybody is likely to get it, if he scratches hard enough.

So I bet you a dollar that you have a Merry Christmas! If you don't, then write and tell me why, and I'll pay the bet. But you've got to show me. No, not me, but the committee that is handling the Miserable Christmas fund.

To prove that this bet is on the level, I have appointed a committee of judges, consisting of the stenographer, the office-boy and the night watchman. If, after reading your letter, they say you didn't have a Merry Christmas, I'll send the dollar.

And, believe me, that bunch would like to see me lose. Not because they have anything against you, you understand, but they would like to see me dig down for that dollar. If they can't get it, they would like to see somebody else.

Of course, you may not have a Merry Christmas, at that. A lot of things might happen. The barber might run away with your wife—and bring her back. You might be mentioned—not in a will—but in a raid.

Some bootlegger might leave his address book laying around. The excuse you give your wife might not work any better than a cheap die. You might have your telephone taken out, or your tonsils. A lot of things might happen. If so, write and tell me.

If the committee says you didn't have a Merry Christmas, I'll send the dollar. But I know you would rather have a Merry Christmas. That's easy: Use Nye Tools. They work so fast, and last so long, that nothing else matters.

Wishing you a Merry Christmas, and betting you a dollar that you have one, too,

Merrily yours,

Harry G. Nye.

P.S. Of course, if you do have a Merry Christmas, why not wish Old Harry Nye a Happy New Year with an order?

Copyright 1927 by Harry G. Nye.
All rights reserved.

OTHERWISE KNOWN AS

THE NYE TOOL & MACHINE WORKS

MANUFACTURERS OF HIGH GRADE PIPE TOOLS

4120-30 Fullerton Avenue Chicago, Illinois

Mr. *Wholesaler*:—Look over your inventory and

FOR QUICK TURNOVER IN 1928

LET US FILL THE GAPS!

"A DEPENDABLE SOURCE OF SUPPLY"

The RICHMOND FOUNDRY & MANUFACTURING CO. Inc.

RICHMOND ~ VIRGINIA.

Between Ourselves

The man who is so busy that he does not have time to read his trade paper is like the man who was so busy chopping wood that he did not have time to sharpen his axe

RESIDENTS OF MANHATTAN ISLAND and the cities in New Jersey are looking forward to the opening of the Holland Tunnel, the longest automobile tunnel in the world. Its use will eliminate the arduous ferry trip across the Hudson River, making it a pleasanter and faster trip from one shore to the other. But how many motorists in making that trip will quite realize what has been done in the construction of that tunnel to make it safe for human life? They will all know how long it took to construct the tunnel, and what a hard job it must have been to burrow through the mud and rock at the bottom of the river. But few will realize what was the most important factor in its construction, the ventilation of the long tube. Carbon monoxide, the deadly gas given off by internal combustion motors, is a constant menace to the lives and health of anyone who runs an automobile motor in an enclosed place, and engineers were confronted with a stupendous task in giving the Holland Tunnel the proper ventilation to make it safe for transient motorists. The interesting story of this ventilating job is told in this issue. It is a ventilating job which will command the respect of engineers for years to come. It will make the air in the tunnel so pure that the passing motorist will forget how hard it is to get fresh air into such a tube, and go on his way unmindful of the fact that without ventilation such a project would be an impossibility of achievement.

Do You Know—

1.—Does a 45-degree elbow or a 90-degree short radius elbow retard water flow the most?

2.—What is the usual percentage of reduction allowed gas consumers when gas is used for space heating?

3.—Does the installation of traps keep sewer gas out of a house?

4.—How much more radiation is required for hot water than for steam heating systems?

5.—What range of steam pressures does a low pressure gravity return steam heating system embrace?

6.—What is the principal factor affecting the amount of the change of level of water in a trap?

Answers will be found on page 82

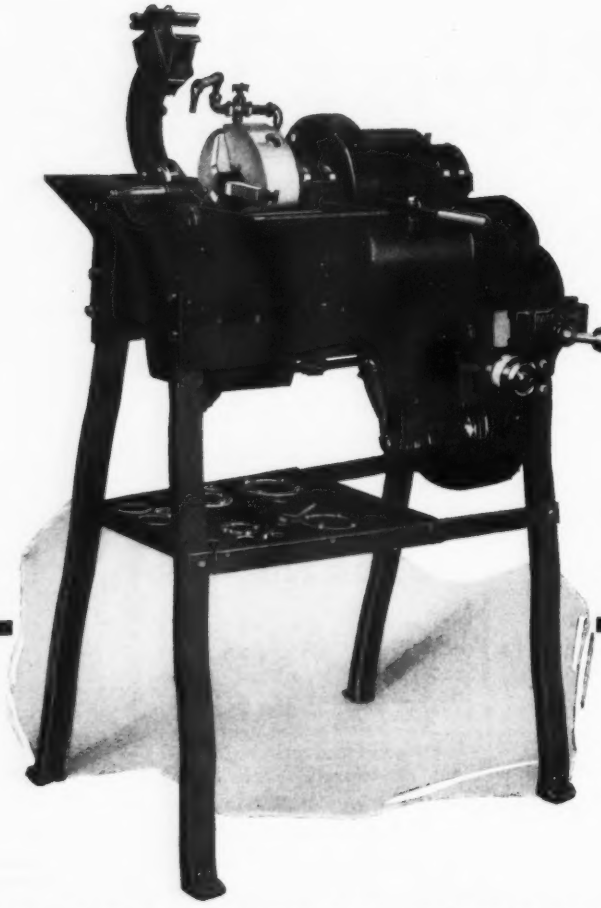
NOW THAT WE ALL FEEL A LITTLE closer to Mexico on account of the recent flight of our "flying ambassador," it might be a good time to discuss plumbing conditions in that country, and other neighboring countries of about the same latitude. These countries have been a little behind the United States in the matter of sanitation, and are still lagging. But rapid strides are being made to bring in the convenience and sanitation of American plumbing goods. On account of the heat usually so prevalent in these countries, there is greater need and desire for bathing, and the people are slowly but surely being educated to the bathing movement. This is evidenced by the amount of American plumbing goods shipped into them, as told in "American Plumbing Goods Abroad," by J. W. Palmer, the second part of which is published in this week's issue. It gives us a good idea as to what other countries are doing in their efforts to promote sanitation. While we are thinking now of improvements such as color, new finishes for faucets, and others, people in the Central American countries are still struggling for the essentials of a sanitary life. That these struggles are succeeding is pointed out in this article.

ANOTHER HEADLINE ON this week's bill is the return by popular request of our well-known friends, Dolan and Olson. After a tour around the circuit they have returned to tell of some more of their interesting experiences in the field of plumbing and heating. Usual and unusual experiences of these men take on an unusual coloring as told by Jerry Dolan. He seems to have that power to make an average sentence or paragraph over into one which amuses you and me, and I trust he never loses that ability. Never sacrificing accuracy or truth for their humor, these partners furnish an amusing slant on the woes of the master plumber and heating contractor.

TWO WEEKS AGO WE PUBlished the first half of an interesting research on "The Friction of Water in Elbows," by F. E. Giesecke, C. P. Reming and J. W. Knudson, Jr. "The benefits of education and useful knowledge generally diffused through a community are essential to the preservation of a free government" is the quotation of Sam Houston which is printed as a foreword in the bulletin on the subject of the friction of water in elbows. It is for just such a reason that we are publishing this story. Very few men in the plumbing and heating industry know a great deal about this subject.

Your Editor

"TOLEDO"



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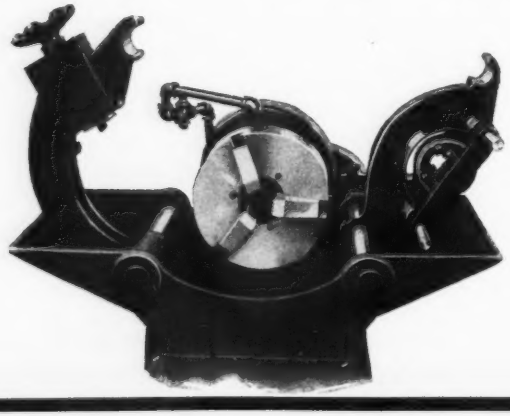


Instant change from cutting to threading and vice-versa, simply by tipping the arms.

Ten seconds to change dies, and the pipe is reamed as thread is cut. No lost time.

DOMESTIC ENGINEERING

Vol. 121, No. 13
Whole No. 1828

The Plumbing and Heating Weekly

Chicago, Illinois
December 24, 1927

OBSERVATIONS

Merry Christmas

At this season of the year, when happiness and good will should prevail above all else, we want to extend to all our readers the wish that they enjoy a very Merry Christmas and the hope that the spirit of the times will enter the business world as well as the heart, helping thus to make plumbing and heating a better business for those in it and even a greater constructive force for the good of all civilization.

Eliminating Seasonal Waste

The chart on shipments of water softeners in our "Markets" section of the December 10 issue showed that sales of such equipment climbed rapidly from a January figure of 1,273 units to an April peak of 1,878 units, fell off to 1,238 units in July and rose again to 1,743 units in October. A line tracing this business from month to month goes up and down, up and down, reflecting quite an uneven demand.

It is seasonal fluctuations such as this that makes for waste in industry. If this line could be straightened out it would mean that organizations could be kept busy and profits spread evenly over the entire twelve months. The way it is now, there is a rush of business one month and a dearth of business, in comparison, the next.

Spread Over Year

In studying this chart for a way to straighten the line out, it would seem that the old home—that is, the home already standing—is the answer. Apparently water softener sales now depend largely on new building, for April and October are the peak months of the year and these are the months in which new homes are being finished for Spring and Fall occupancy. In the other months when new homes are not being built in such large numbers the sale of water softeners is correspondingly light. Thus, it would seem that the place to put the sales effort is the old home, and a determined drive for old home business on water softeners and many other products would undoubtedly help to make every month as productive as another.

Old Home Business

Plumbing and heating have lost a great deal of their former seasonal character and have become more of a year-around calling than they used to be. But a chart such as we refer to on water softeners shows that the trade can take greater advantage than it is of the opportunity to bolster up months that would be slack if they had to depend entirely on new work.

Resale Price Legislation

A bill legalizing contracts as to resale price has again been introduced to the present Congress. The Capper-Kelly bill was given extensive hearings in the last session of Congress and a substitute was prepared. It is this substitute which is being presented at this session and, as we understand it, it is identical in principle with the original Capper-Kelly bill.

It restores to producers of trade-marked goods the right to make resale price contracts with distributors, but provides that such commodities may be resold without regard to such agreements in cases of closing out stock, disposal of damaged goods and bankruptcy. The bill also expressly prohibits price agreements between producers, or between wholesalers, or between retailers.

Now Before Congress

If this industry wants resale price legislation such as is now before Congress, letters from individuals to their congressmen and senators will have their effect in winning support for the bill.

The Desire to Live Well

One of the trends of the times which cannot be discounted in its effect on the plumbing and heating business is the desire for leisure and comfort and the ability to buy those things necessary to the satisfaction of this desire. People today have more time for recreation and pursuits outside of business than they ever had before. They have more money. As a result, the home is more important to them than it otherwise might be. Conditions possible to put up with under some circumstances become unbearable under others. In the matter of home conveniences, for instance, more and better appliances and equipment are necessary in the circumstance of considerable leisure time in the home than they are in the circumstance of long hours of work away from the home. This may appear vague in its application to plumbing and heating, but it undoubtedly has a good deal to do with business in this field—and will continue to have its effect in the years ahead.

Helps Business

Ventilating the Holland Tunnel

Fig. 1.—One of the eighty fans for ventilating tunnels, each 15 feet in diameter

PICTURE a storm such as ravaged parts of Florida a year ago or the more recent one that damaged St. Louis so severely. Imagine a wind with a velocity of approximately 70 miles per hour, a speed sufficient to cause untold damage. A hurricane such as this is now within the province of the ventilation engineer, for the men in charge of the ventilation of the new Holland vehicular tunnels under the Hudson river between New York and New Jersey, which were opened in November, were faced with the problem of taming a tornado of this sort, and have completed their task successfully.

The object of this and other tunnels is to facilitate travel. In building tunnels, safety is a first consideration. In the Holland tunnels, the foremost safety measure was for the elimination of automobile gas. That is where the ventilating engineer comes in. And if this tunnel is to be kept clear of foul air, air that by its peculiar content is more deadly in its way than some of the best known poisons, it is necessary to force the equivalent of a 72-mile-an-hour gale through its almost two miles of length. It is, of course, obvious that such a man-made storm is impracticable in the part of the tunnel that is used for traffic. Imagine the difficulties one would meet driving against a windstorm such as this! Think of the roaring furnace it would cause if an automobile should catch fire! Here is the story of how engineers caused a tornado for the protection of human lives, then taught it to do their will.

First of all, a few facts about this tunnel, which is really one of the wonders of the world. It was first started in 1920, and seven years have been devoted to its construction. It is 9,250 feet long, of which 5,480 feet are under the river. When one takes into consideration the fact there are 5,280 feet in a mile, he will realize the magnitude of these twin tubes bored through the earth, 50 feet below the bed of the Hudson River, one for eastbound and one for westbound traffic. Each of the tubes is 20 feet wide from curb to curb, with headroom of 13 feet six inches. There is a raised footway approximately 3 feet wide on one side of each tube, for the use of traffic policemen. If your city has 12 blocks to the mile, which is the usual layout, picture a tunnel stretching from First street to Twenty-second street. In New York City it would stretch from Washington Square at Eighth street and Fifth avenue north clear to Thirty-fourth street and Fifth avenue.

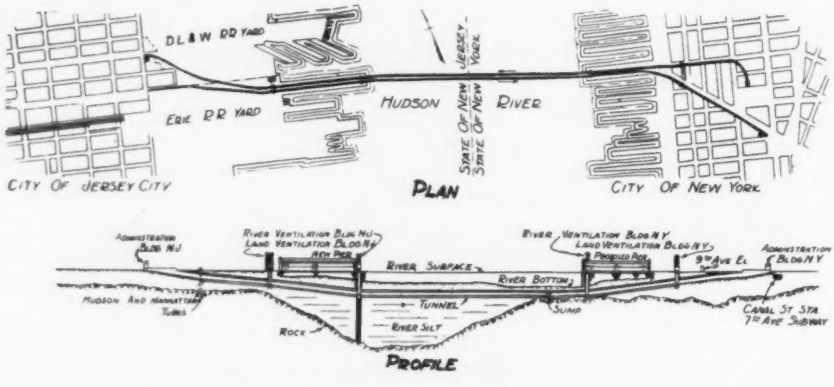


Fig. 2.—Profile and plan of tunnels

SOLVED PROBLEMS IN VENTILATION

PROBABLY the biggest single problem the engineers faced was that of ventilation. The job of boring under a river presents difficulties and perils, but, after all, other tunnels have been built under rivers and the builders had the experience of others to draw from. However, in the vehicular tunnels of Europe, all shorter, a natural draft served to clear the air of smoke, gasoline fumes and poisonous gases. This method proves adequate until the proportion of gasoline driven vehicles reaches a certain point. In New York City there are fewer horses from year to year, with the great bulk of the vehicles operated by gasoline. Gasoline, burning in internal combustion engines, produces the deadly carbon monoxide, and it was necessary to guard against the presence in the air of enough CO to cause discomfort or danger to the users of the tubes.

But until recently little has been known about carbon monoxide, beyond the fact that it is peculiarly treacherous gas, that it is almost odorless, with no irritating effect upon the lungs, and that it asphyxiates just as surely as will the hand of the thug that closes tightly over the throat of his victim. Dr. J. B. S. Haldane, a distinguished English physiologist,

had studied the effect of carbon monoxide after the firing of blasts in mines, but his conclusions were not definite enough to satisfy the engineers. Three sets of tests were immediately contracted for, one at the Bureau of Mines experimenting station at Pittsburgh, one at Yale University, and a third at the University of Illinois. In the first, A. C. Fieldner, a government chemist, directed the work of finding out the amount and composition of the gases discharged by motor vehicles, more than a hundred cars and trucks being tested under a great number of conditions and speeds. It was found that no average figure could be given, but that carbon dioxide given out by cars at normal speed ranged from 0.57 to 2.80 cubic feet per car per minute.

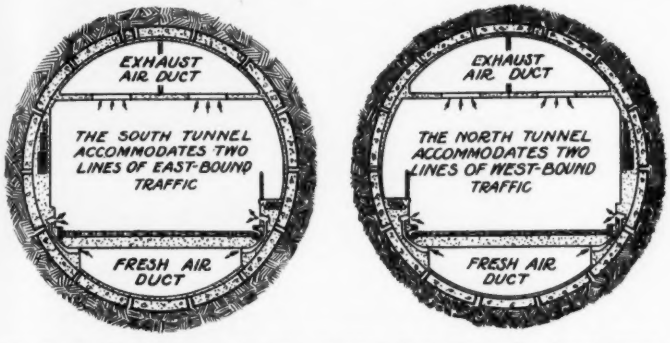

EXHAUST AIR DUCT
THE SOUTH TUNNEL ACCOMMODATES TWO LINES OF EAST-BOUND TRAFFIC
FRESH AIR DUCT
EXHAUST AIR DUCT
THE NORTH TUNNEL ACCOMMODATES TWO LINES OF WEST-BOUND TRAFFIC
FRESH AIR DUCT

Fig. 3.—Cross section of tunnels showing fresh air and exhaust ducts

At Yale, the tests were directed toward determining the amount of these automobile gases that may be absorbed without harmful effect to the human system, the findings being that 4 parts in 10,000 for one hour cause no ill effect, 6 parts are noticed a trifle and 8 to 10 parts have a marked bad effect. It was therefore necessary for the experts to keep the maximum concentration of carbon dioxide at or below 4 parts to 10,000.

In the meantime, experiments were going on at the University of Illinois to determine the power necessary to force air through ducts similar to those which were planned for the tunnel. At the same time engineers there worked out the sizes and the best shape for the exhaust stacks and intake louvres, and exhaust and inlet ports.

Next to be considered was the maximum capacity of the tunnel. Although estimates were that each of the tubes would accommodate 1,900 vehicles per hour, a safety factor of 213 cars was established and the figure raised to 2,113. As the floor is not absolutely level, it was necessary to make estimates of the amount of fresh air required for upgrade, down grade and level grade, it being decided that 295 cubic feet, 125 cubic feet and 225 cubic feet per minute, respectively, would be required.

TWO METHODS OF TUNNEL VENTILATION

THERE were two methods of artificial ventilation to be considered. The first method, the forcing of longitudinal currents from end to end of the passageway of the tunnel, was considered impracticable for the reason that the gale would be felt at its full force, also it seemed impossible to get a uniform distribution of fresh air by this method. In the other method, known as transverse ventilation, air is forced through ducts running parallel to the roadway. The latter method was selected. Tests following those mentioned above, led to the conclusion that fresh air should be supplied close to the roadway level and vitiated air should be drawn off from above.

A study of the cross section illustration of one tunnel will show how this was accomplished. The pictures of the three levels of the north tunnel will show how each tube would look were it possible to be on these three levels at one time. The fans and machinery for the making of this underground tornado were designed to force the fresh air at high speed through the lower duct. From lower duct it is fed through flues 10 to 15 feet apart into a continuous expansion chamber above the curb line on both sides of the roadway. Flow of air in and out of this chamber is controlled, the first by adjustable slides over the flue openings, and the second by a copper steel plate which can be adjusted to give openings ranging from ¾ inch to 1¾ inches in width. The openings in the ceiling for the foul air are also spaced from 10 to 15 feet apart and are from 3 to 6 feet long, and are also provided with slides to control the amount of air that flows through them. Of course, by the time the air has passed through the narrow duct, the longitudinal duct and the narrower inlet port, its force has been spent and it is comparatively a gentle zephyr. The ceiling of the tunnel is finished off similarly to the floor, although it is not as thick or strong. In this ceiling are placed exhaust ports, through which vitiated air passes. It is then exhausted high above the ground level.

Now for the apparatus that produces the man-made, man-controlled tornado. There are four ventilating buildings, of the type shown in the accompanying photograph, two

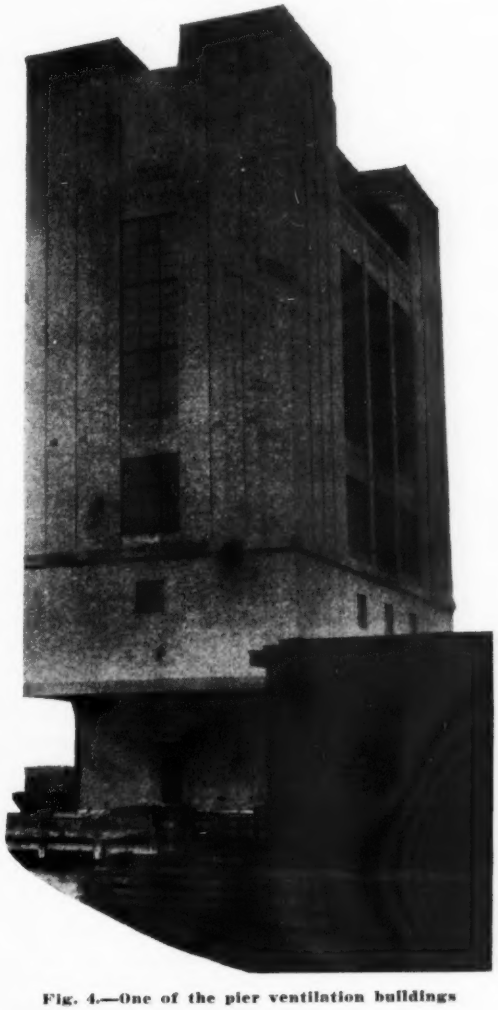


Fig. 4.—One of the pier ventilation buildings

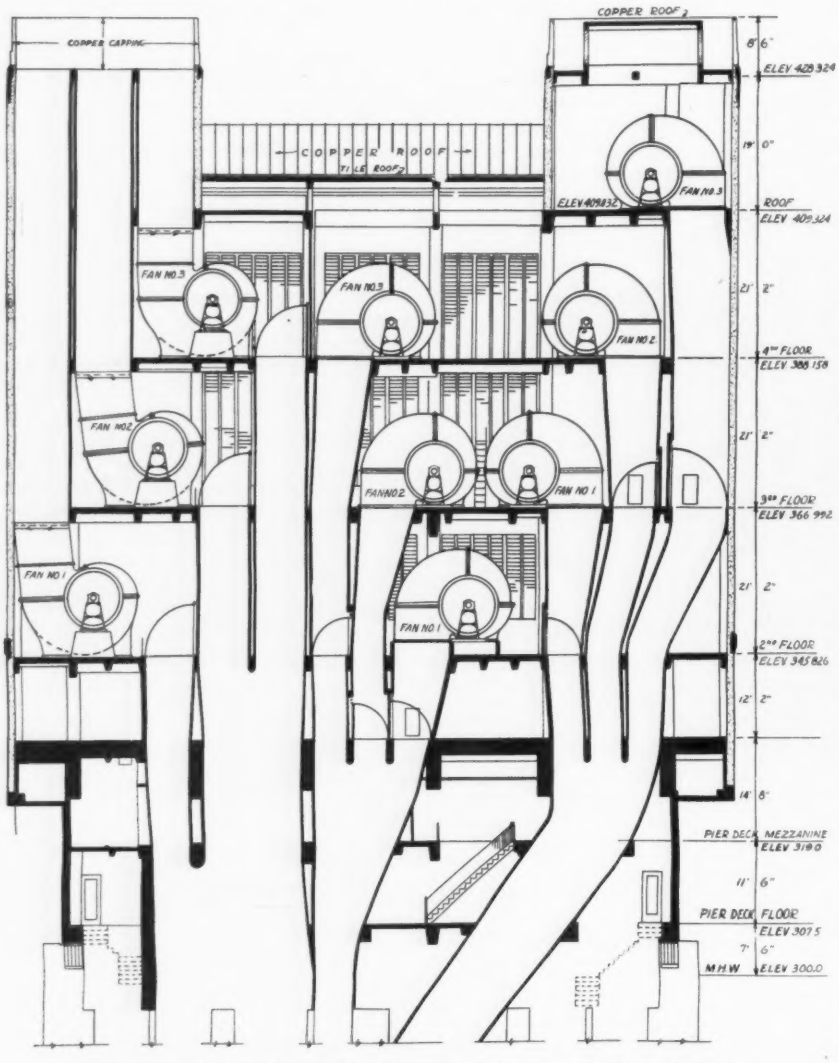


Fig. 5.—Typical vertical section through a tunnel ventilating building

at the pierheads on opposite sides of the river and two inland. Each pierhead building ventilates three sections of tunnel, one-half of each of the river sections and one-half of the intermediate section where traffic starts upgrade. Each of the land shafts in turn handles four sections of each tunnel. These sections are those that extend as far as the pierhead where traffic is on the down grade and one-half of the section, alongside, where traffic is going upward. In these buildings are 14 sets of blowers and 14 sets of exhaust fans, the buildings on the land side containing four independent sets of blower and exhaust fans.

To get the results, pressure and suction respectively, of these blowers and exhaust fans to the tunnel there are 28 ducts, divided equally between blower and exhaust. Each duct has three fans, any two of which will supply the maximum amount of air needed, giving another margin of safety. The capacities of these fans range from 81,000 to 227,000 cubic feet per minute, the size being dependent upon how much of the tunnel load is handled by a duct.

The construction of the ventilating buildings and the arrangement of fans and other equipment is interesting. Note the louvres on the sides of the ventilating building shown, through which the fresh air is drawn. Exhaust air is forced out through stacks extending 20 feet above the room, these stacks being open at the top and provided with drains at the bottom of the fans to carry off rain water. Hoods were not provided, as it was felt these would cause resistance to the leaving air and also deflect the impure air toward the louvres. The blades of the louvres are of heavy wire glass, protected by heavy bronze screens. The glass construction serves to help light the shafts.

The placement of the fans, motors, blowers and the dampers which are used when a fan is shut down is graphically illustrated in Figure 5 showing a typical vertical section through a ventilating building. These are placed so they can be taken out easily, the sides of the ducts being made of bolted steel plates where they adjoin the exhaust fans so that the fans can be removed without having to cut through a concrete wall. Fan casings are designed to facilitate removal of fans and trolley rails extend from a central hoist shaft to points over each heavy piece of machinery.

A longitudinal drain is provided behind the curb at the low side of the roadway in order to drain off the water that may accumulate. The roadway has a transverse fall of 1½ inches so that the water will flow to the drain. From the drains, the water runs to five sumps. A sump is located under each ventilating shaft and one at the river sump which is located in the rock ledge beyond the pierhead line at New York. Here automatic pumps force the water up to the river and city sewers. The approach roadway is also provided with drainage. These drains slope toward the tunnel and are designed to carry off the water that may accumulate following the greatest rainfall that may be expected. The pumps together have a capacity of 6,850 gallons p. m.

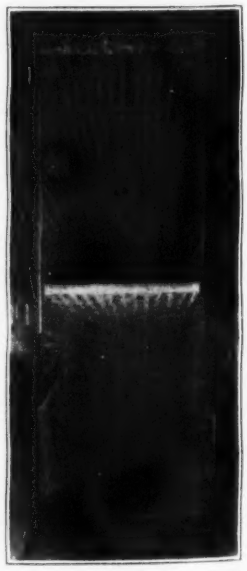


Fig. 6.—Interior of air duct, showing where it completes the turn from under the roadway to a position at the side of the tunnel

CONSTANT CONTROL BY 20-FOOT SWITCHBOARD

WHILE not strictly the province of a ventilating engineer, we are interested in

the mammoth switchboard, 20 feet long and seven and one-half feet high, shaped like an arc, which controls the operation of the tunnel. The man who controls this switchboard is a King Boreas brought from ancient mythology to present times, as he controls the storm by a mere putting forth of an arm and hand. Myriads of lamps glow before him. One battery, for instance, tells what each of the 84 fans is doing. At a glance the operator knows

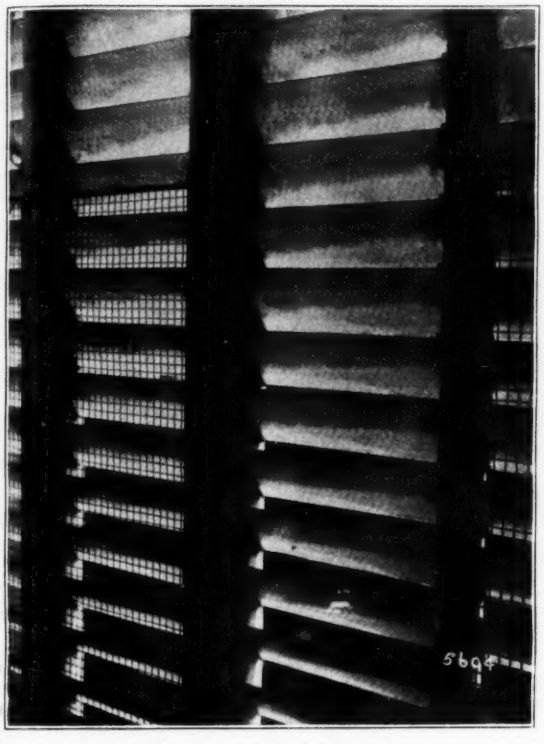


Fig. 7.—Detail of louvers

if any of the fans that should be operating have stopped, or if everything is running smoothly. All fans can be turned off and on at once or each one operated individually. Another set of lamps tells of the traffic signals in the tubes and another lets the operator know about the amount of carbon monoxide in the tunnels. Still a fourth keeps check of the water that may have seeped into the roadways or ducts, flashing a warning to start the pumps. And there, too, is a telephone for the 40 policemen who patrol the two shafts to notify the operator when something unusual occurs, which may necessitate the flashing of the "stop engine" signals throughout the tubes, thus stopping the flow of carbon monoxide.

Maybe, for instance, there is a fire. If that 72-mile-an-hour gale were sweeping longitudinally through the tunnel, think of the holocaust, the panic that would be created. Now, there is little danger. Recently a gasoline soaked automobile was burned up in the tunnel to test out the equipment. Policemen grabbed fire extinguishers and sand from the closets which are placed 125 feet apart. The foam and sand quickly extinguished the flames, the smoke being drawn out of the exhaust ports almost immediately. Then another car was prepared and ignited and a call sent for the fire-service "engine," a picture of which is shown. Again, in the space of a few minutes, the fire was out. In many ways, one is safer in the tunnel if a fire should break out than he would be in a car on a traffic-jammed public highway where fire protection is not so good.

Possibly it is merely a break down or minor accident. Again the "stop engine" signs blaze, the service car appears in a moment, hooks onto the disabled car and whisks it out of the tunnel.

Now a note about the men who have accomplished this marvel of modern engineering. The chief engineer, Clifford M. Holland, for whom the tunnels were named, died in 1924, his place being taken by Milton H. Freeman. When Mr. Freeman also passed away, Ole Singstad, who had been engineer of designs, was appointed chief. The ventilating equipment was installed under the direction of Ralph Smillie, present engineer of designs; A. C. Davis, mechanical engineer, and J. N. Dodd, electrical engineer. The ventilating building construction was done by the De Riso Construction Co., the fans and motors being fur-

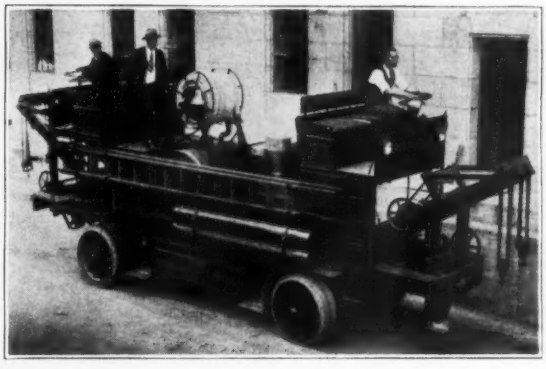


Fig. 8.—A combination fire truck and trouble car for tunnel service

nished by the B. F. Sturtevant Co. and the General Electric Co. The ventilating fans, electric motors and control apparatus for the ventilating system were erected and installed by John W. Hooley, contracting engineer, New York City. The plumbing and heating equipment was installed by Lossack-Gaynor Corporation, Long Island City, N. Y.

Typhoid Becomes Rare

"TYPHOID," says Dr. W. A. Evans in the "Chicago Tribune," "is becoming one of the rare diseases. In a recent study of several thousand students at the University of Minnesota it was found that only one in thirty had had typhoid fever. Thirty years ago a similar study would have shown that more than one-third of the student body had had the disease. No other of the usual forms of infection is so rare at the present time. This is a reason for increased vigil. If the thing is so near done for, why not finish the job? But there are people who do not feel that way about it.

"For instance, in New York state there were those who despaired of getting typhoid fever by any of the orthodox routes. They went in swimming in a small stream into which a town discharged its sewage. The sewage was untreated and the swimming hole was downstream from the sewer outfall.

"If only 3 per cent of this Minnesota group of university students had had typhoid fever the probability is that about 95 per cent of them will get through life without ever having the disease.

"When the disease becomes as rare as that, there is not much chance for the bacillus to propagate. So far as we know, typhoid bacilli do not live in any animal except man. They do not multiply in water, nor do they increase in a threatening way in milk or soil."

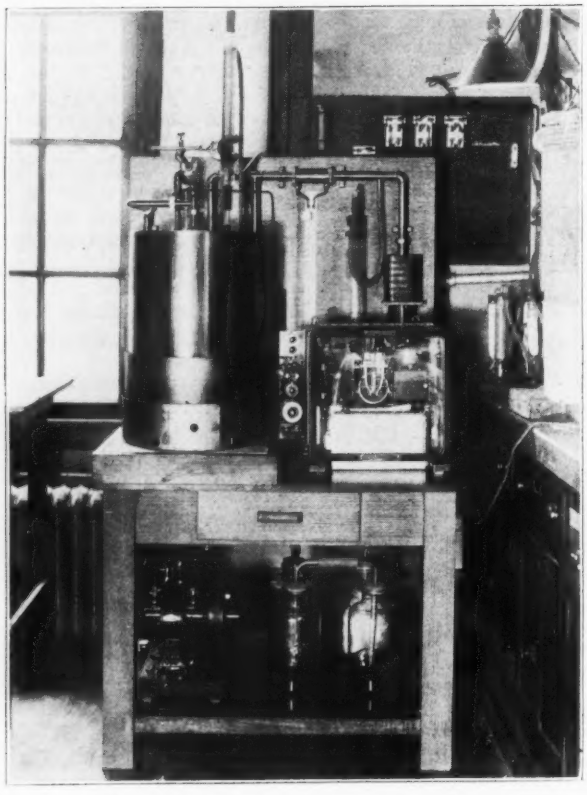


Fig. 1.—Carbon monoxide recorder and alarm

Carbon Monoxide Alarm for Holland Tunnel

IN THE course of its investigations relating to the gases that may endanger the health and safety of workers in mines and industrial plants, the Bureau of Mines has given particular attention to that deadly gas carbon monoxide (CO) which is produced by the incomplete combustion of coal and other fuels. The bureau has studied the physiological effects of the gas, the treatment of persons overcome by it, and the methods of detecting it. At the request of the New York State Bridge and Tunnel Commission, which desired information on the contamination of tunnel air by carbon monoxide in the exhaust gases of automobile engines, the Bureau of Mines made tests to obtain necessary data for a ventilating system for the Holland vehicular tunnels under the Hudson River at New York City now in operation. The data obtained for the Holland tunnels were applicable to the Liberty vehicular tunnels at Pittsburgh, Pa., completed in 1924. The Liberty tunnels are twin tunnels 5,888 ft. long. Midway in each tunnel a two-compartment shaft leads to the fan house at the surface. In the fan house are 8 fans, 4 of which exhaust the air longitudinally through half of the tunnels while 4 blow all through the other half.

Four parts of carbon monoxide in 10,000 parts of air was determined as the maximum concentration to which a person may be exposed for one hour without noticeable effects; or, if the concentration is increased from zero uniformly for one hour, the maximum concentration tolerable is 6 parts per 10,000, averaging 3 parts per hour. An apparatus that would automatically determine and record such low concentrations of carbon monoxide was obviously desirable and was considered at a conference between C. M. Holland, chief engineer of the Holland tunnel, members of his staff, and members of the Bureau of Mines. Then the Bureau of Mines, through its Pittsburgh experiment station, undertook the development of a suitable recorder.

The principle employed is measurement by means of thermocouples of the increased temperature of the gases when the CO and oxygen react chemically in the presence of a catalyst, the thermoelectric effects being recorded by means of a recording potentiometer. After extended experimentation and development a recorder was produced which is not appreciably affected by the presence of other gases and which is capable of indicating and continuously recording the highly diluted CO. Operation over a period of six months proved it to be reliable.

Another apparatus gave continuous and satisfactory service for five months at the Liberty tunnels analyzing exhaust air from one section. This apparatus has enabled health officials to ascertain that the ventilating machinery has operated properly and that the ventilation has been ample at all times. The recorder is equipped with a bell to warn attendants in the fan house should the CO in its section at any time exceed 4 parts in 10,000. Further, the recorder can effect considerable saving in power at the fan house if the volume of air is reduced when the CO is low.

Carbon monoxide recorders should be useful also for promoting economy in boiler furnaces, blast furnaces, and other metallurgical and chemical equipment, and for investigations pertaining to them. They may be useful wherever CO is an important factor because of hygienic, technical, or economic reasons, or in gaseous processes when CO can be introduced as an inert component. The

recorder has proved to be the most sensitive instrument known for determining carbon monoxide.

A complete unit CO recorder includes a motor-driven blower for the gases, a gas cleaner and purifier of sulphuric acid, caustic soda material, activated charcoal, filters of absorbent cotton, and fused calcium chloride drier, a flow meter arranged to maintain a constant rate

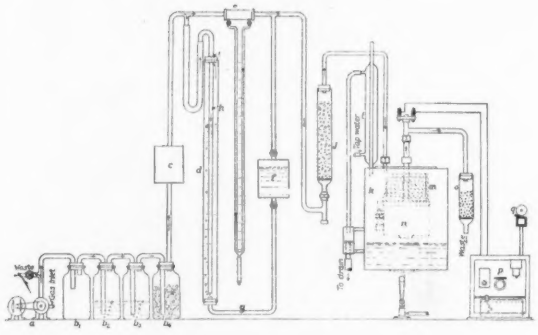


Fig. 2.—Diagram of essential parts of carbon monoxide recorder

of flow of gas through the cell, and copper coils for bringing the gases to the temperature of the cell environment before entering the cell. After passing through the cell the gases are wasted through a guard of fused calcium chloride to prevent entrance of water vapor. The recording potentiometer includes mechanism for closing an electric circuit to ring a warning bell or operate signals as long as the CO exceeds a predetermined concentration.

Principle of the Carbon Monoxide Recorder

When carbon monoxide unites chemically with oxygen to form carbon dioxide (according to the equation, $2CO + O_2 = 2CO_2 + 67{,}960$ calories per gram molecule of CO), the heat liberated increases the temperature of the gases themselves and the matter in contact with them. The recorder uses this effect as a means of indicating as well as recording the concentration of the CO in air. Hopcalite catalyst **5** is employed to promote the union of CO and O_2. Thermocouples generate electric potentials which increase with the temperature, hence the CO and the effects are recorded by a recording potentiometer calibrated in terms of carbon monoxide.

Mechanism and Structure

Fig. 1 is a picture of the carbon-monoxide recorder and Fig. 2 is a diagram of the essential parts. Arrows point the gas flow. The motor-driven blower **a** forces the gas through the train or succeeding parts; the excess gas is wasted through a side outlet controlled by a hand-operated valve. The gas passes through the four bottles, b1, b2, b3, b4, in series; the second and third of these contain sulphuric acid wash to dry the gases and remove hydrocarbons, ammonia, and other gases soluble in or retained by sulphuric acid. The first and fourth bottles serve as traps to prevent passage of acid to other parts of the apparatus. The gases pass next through a canister **c** which contains granular activated charcoal, alkaline granules, and filters of absorbent cotton. These allow the air and CO to pass through, but retain all other gaseous impurities or suspensoids which may materially affect the catalyst. Hydrogen, methane, and some carbon dioxide, when present, are not restrained but these gases (at their low concentrations) have no effect or a negligible one under the conditions of operation. **6** Methane is not oxidized nor does it affect the catalyst at the temperature employed. Hydrogen has an effect so small that it may be disregarded, and carbon dioxide is inert. The parts **d**, **e**, and **f** constitute the flowmeter and accessory parts for adjusting the flow and maintaining a constant rate. The gases pass to the receptacle **j** which contains broken, fused calcium chloride to remove any additional water vapor coming from the flowmeter parts. From there the gases pass to the steam-bath **k** heated by a gas flame. A reflux condenser stops escape of steam and constitutes a vent which

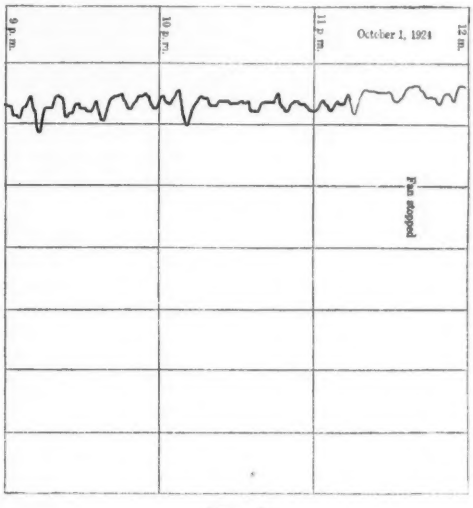


Fig. 4

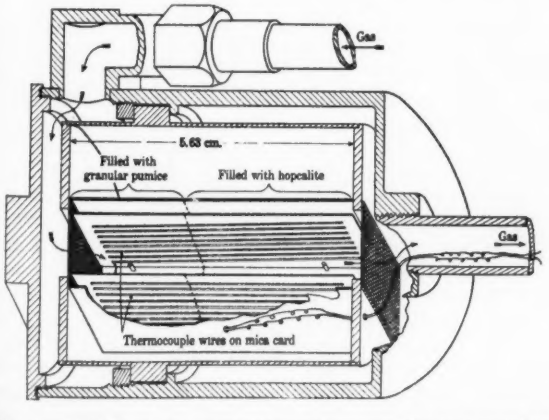


Fig. 3.—Details of cell containing thermocouples and catalyst

maintains atmospheric pressure in the steam bath so that the steam temperature is as constant as the barometer. The gases pass through coil **m** in the steam bath where they are heated to 100 degrees C., then through the cell **n** which contains the thermocouples and catalyst.

Fig. 3 shows the cell in detail. Forty-eight pairs of differential couples of silver and constantan or of copper and constantan are used in two cells.

The gases escape from the apparatus through a guard tube **o**, Fig. 2, containing calcium chloride and activated charcoal to prevent penetration of water vapor and gases to the hopcalite when not in use.

Potentials generated by the thermocouples when CO is oxidized, thereby heating the upper thermo-junctions above the temperature of the lower, are transmitted through leads to the recording potentiometer **p**, which is calibrated in terms of CO as parts per 10,000 parts of air-gas mixture. The calibration was made with synthetic mixtures of CO and air of known proportions, passed at a rate (46 liters per minute, more or less) to produce maximum thermo-electric effects.

On the job with Dolan & Olson

A dinner party cost this Dolan & Olson customer about $321.50

THEY SAY that it never rains but it pours, and that seems to be the case most of the time in the plumbing and heating business. Just for example, a chap by the name of George, not having anything else to do, got to fussing around his heating plant one nice warm June day and, after cleaning the soot and scale out of the smoke pipe and the boiler itself, decided that it would be a darn good stunt to change the water in the plant, so he hooked on the garden hose, lighted his pipe and watched the water pour out of the boiler and into the floor drain.

Everything was running as smooth as silk when the missus called attention to the fact that he was due at a dinner party within the hour, so he waited until all of the water had run out of the plant, disconnected the hose, and proceeded to doll up for the party.

And in the days that followed, what with one thing and another, he just naturally forgot to fill that plant with water, and the tenants, having bundles and bags and rolls of old paper to destroy, just chucked them in the heater and touched them off with a match, and when Daddy George got round to filling that plant with water it looked like a sieve.

'Course that gave him a wonderful chance to pan Mother for making him go to that dinner party and all of the time that we were on the job, taking out the old section, installing the new one, making the new pipe connections, and patching up the covering, we could hear him muttering about that "dog-gone dinner party" and how it looked like it would cost him just about $321.50. He wasn't very far from being right, at that.

And then our friend Louie pulled the same stunt in his four-family flat building; drained all four of the boilers and left them without water, but luckily for him the tenants only fired up two of them.

And Abie tried the same thing with a boiler that is not made any more, so we are having the sections welded and, if the Goddess of Good Luck is pulling for Abie, he will get out of it without having to buy a whole new boiler.

AN EARLY CALL

SO MUCH for that. It's a great game. Battling for the new work on a cut-throat basis and then handling service calls that bring along some most peculiar incidents. Just for example, at four o'clock the other morning the phone bell rang—and if there is anything on earth that jars a fellow more than a phone call at that hour of the day, I don't know what it is. It rang and rang and rang. I heard it, but could not seem to figure out that it was intended for me, but finally came to the conclusion that it would keep on ringing until I did answer it. So I hopped out of bed, raced down stairs, and grunted a most unpleasant "Hello."

From the other end of the line came the inquiry, "Is this Drexel 7329?" "It is." "Well, is this Mr. Dolan?" "Yes." "Mr. Dolan, the plumber?" "Yes." "Well, this is Mrs. Dunn. I woke up a little while ago and heard some water running through the ceiling from the flat above, and so I shut off the water in the basement and it has stopped running now, but do you think that it will be all right until morning?"

For crying out loud, what do you think of that?

Roused out of a sound sleep just to answer a dumb question like that.

Sure, there was only one thing to do and I did it. Told her that everything was Jake and that we would be over like the fire department bright and early in the morning. We were, and we found that the hot water tank had sprung a little leak and we advised a new tank and also suggested moving it to the basement, along with the water heater, but she wanted to wait awhile (probably until it

breaks again some Sunday morning at 4 a. m.), and so we plugged it and repaired a couple of faucets and trekked back to the shop.

Sent her a bill for the time and repair plug and fuller balls, and she called up and hollered her head off because she thought that we had overcharged her at least a half hour and I didn't have the heart to tell her that she had only been charged for the actual time to and from the shop and on the job, whereas I had lost three hours of perfectly good sleep, which is not to be laughed at in these days when a plumber has to run a plumbing shop, attend lunch club meetings, play golf with the architects and customers, play bridge with the ones that both do and do not play golf, and try to squeeze in a little sleep between the last Welsh rarebit and the first Mocha and Java. It's a hard life.

But there is a bit of sunshine once in a while anyhow. Just the other morning a master plumber, who used to drop into the shop and borrow a fitting or a thread when he was working as a journeyman for one of the other bosses, came in for a bit of pipe instead of going all of the way back to his own shop for it and, after getting the pipe and passing a few remarks about the weather, the business and the baseball team, started for the door, then came back and said: "Say, Jerry, do you recall that just before I went into business I came around to see you one day and we had a long talk and you gave me some dope about billing out jobs, collections, and one thing and another? Well, it didn't mean much to you, but it has meant a whole lot to me, and I want to tell you that I appreciate it."

HOW NOT TO GIVE ESTIMATES

ME AND HANK slipped up on a little job a short time ago that is going to be an object lesson to us for a long, long time. 'Way back in the good old summer time, Hank took a call to estimate a little job of remodeling. So he visited the job, talked with the lady of the house, got all of his measurements and a list of the fixtures, came back to the shop and figured the job.

Added a bit to the actual cost to cover overhead and profit and then decided to drop around and give the lady the quotation in an effort to make a sale at the same time.

All serene. Hank occupied one of the big chairs in the parlor and told his little story, stressing the quality of the fixtures and the workmanship, finally quoting the price by writing it on the back of one of his business cards and handing it to the prospective purchaser who expressed the opinion that the price quoted was too high as she had expected that the job would not cost over $200 whereas Hank quoted $275, and assured her that he was giving her the job for cost and throwing in his heart's blood for good measure.

Failing to make a sale, Hank wended his way to the next call and forgot all about the job until three months later when the lady called up and said that she was ready to have the plumbing work done. So we booked the job, took out our various permits, jumped into the job and cleaned it up, and sent her a bill for "Plumbing installed per quotation."

And the bill came back. Also a brief note to the effect that we had quoted $175. Then followed the usual battle with plenty of "I said to you" and "You said to me" and "The other fellow quoted less than $275," a tender on her part of $175, and a declaration that she was a poor woman and couldn't pay any more than that, then an offer of $225, and finally by standing pat and talking whenever the opportunity offered, which was not very often, we managed to get her to plank down the $275, for which we gave her a most beautiful receipt.

From now on, all quotations will be in writing, with duplicates in our files and when we get an order to "Go ahead" we're going to have somebody's name on the dotted line before we start.

While the debate was on Old Timer strolled into the office, parked himself behind the morning paper, and after it was all over remarked he had been through the same mill and had also helped another chap through the experience mill. Seems that Old Timer had needed a new roof on his home, so he called various roofers and got various

Hank gives an estimate—but not on a signed contract form

prices. The whole matter dragged along for a couple of weeks and then it began to rain, so he needed a roof and wanted one quick. In the meantime, he had been advised that a certain concern was selling A1 roofs for less money than anyone else, so he gave them a ring and their estimator showed up. Took his various measurements, showed his samples and Old Timer made his selection, and then agreed to go back to the office and prepare the estimate and mail it.

But this would take time and it was raining and Old Timer wanted action and lots of it, so he requested this chap to do his stuff and do it quick, with the result that this estimator prepared an estimate and quoted a price and when requested to do so by the Old Timer jotted it on the back of one of his business cards and put his John Hancock below the price.

4 A. M.!

IT HAPPENS IN OTHER INDUSTRIES, TOO

THE PRICE was low in comparison with other prices received so the Old Timer told him to get his stuff on the job and slap 'em on the roof and there would be a check waiting for him the minute that the last nail was in place.

And with the feeling that a dollar saved is a dollar earned, the Old Timer took his wife down town and bought her a new hat.

In the meantime, it continued to rain, but the new roof did not show up, so the Old Timer called the roofer on the phone and wanted to know when he was going to get some action.

They asked for his name and address, told him to hold the line a minute, and pretty soon came back with the word that they could find no record of any quotation, whereupon he explained the whole transaction, to which they answered that they figured all jobs in their own office; made out all quotations in duplicate; and did not permit any of their men to guess at job costs and selling prices, but checked every quotation before it left the office. If an estimate was wanted, they would be pleased to send out another man and submit a proper proposal but Old Timer decided that some one had slipped and knew that the next price would be higher than the stars so he told them to forget it and then placed the business with the next lowest bidder.

He said that taught him the folly of jumping at conclusions and trying to estimate jobs on the fly even in his own business, so he stole a page from the roofer's book and made it a part of his own business creed, one result of which is that he is now a "retired" master plumber, while most of the old timers are only "tired master plumbers," merely lacking the "re" to qualify for a life of ease and comfort.

And then to make a good day better, a woman came into the store with a cheery "hello" and a smile that just made everyone feel better and told Hank and everyone else that Hank and his crew had worked wonders with the heating plant in their home.

As she told the story, the heating plant had been the one thing about her home that was not satisfactory, and she had put up with it year after year, thinking all of the time that something could be done and yet fearing to make a start, until finally over a bridge table, some one had put in a good word for "Dolan and Olson" and she determined to seek a winter of comfort in her own home.

She had called Hank and he had made a study of the plant and without asking any questions as to price, she had told him to go ahead and Hank had done so. The job completed, we had rendered a bill, then along came Jack Frost with his heating plant testing apparatus and this woman found that she had a heating plant that would keep Jack Frost on the outside looking in and she was satisfied.

So pleased, in fact, that she wanted to know if we had billed her at special prices, lower than usual. Some shock, of course, and it was not easy to come back and assure her that we had charged her all that we thought we had earned, but between us we managed to do it.

And then she trumped her own ace by planking down two hundred dollars in perfectly good United States currency in payment for a bill of one hundred and forty dollars; insisted that we take it and declared that it was worth more than that to her; and suggested that we use her for a reference if anyone wanted to know anything good about us.

And with that same cheery smile, she bid us "Good-bye," and I looked at Hank and Hank looked at me, and the bookkeeper looked at both of us and said that he never would have believed it, if he hadn't heard it, and even at that he wasn't sure that he wasn't dreaming a bit and would wake up to find his hands in the dish water instead of in the pot of gold at the end of the rainbow.

RECOMMEND PLAN FOR SMOKE ABATEMENT

A special smoke advisory committee appointed by Dr. Louis I. Harris, Health Commissioner of the City of New York, recommended at a public hearing on December 12 that all coal and oil burners in New York City be licensed, in order to curb the smoke nuisance there. Another recommendation of the committee provided for a request to the U. S. Bureau of Standards to develop a suitable instrument for measuring the amount of smoke discharged from a stack or chimney. Should the former plan be adopted, it would probably include provisions for all users of soft coal to file plans and specifications of their heating units, these to be passed upon by the department's engineers. Anthracite coal burners would not be compelled to file these plans, but would have to take out the licenses.

Mr. Harris suggested that an engineers' board of appeals be formed, which could pass upon cases appealed from the decision of the smoke abatement division. This idea met with the approval of some of the heating engineers present, as it insures handling by men properly equipped by training to pass upon heating problems. Among the members of the American Society of Heating and Ventilating Engineers present at the meeting were A. V. Hutchinson, secretary of the society, and George W. Martin, who also represented the Building Managers' and Owners' Association.

Friction *of* Water *in* Elbows

II

By F. E. GIESECKE
C. P. REMING
J. W. KNUDSON, JR.

"The benefits of education and useful knowledge generally diffused through a community are essential to the preservation of a free government."

The above quoted from Sam Houston of Texas, and which appeared as a foreword in the bulletin on "Friction of water in elbows" explains the reason for publishing that bulletin in "Domestic Engineering." The first part appeared in the issue of December 10. The second and concluding part is given below.

F. E. Giesecke, C. P. Reming and J. W. Knudson, Jr., of the bureau of engineering of the University of Texas, Austin, Texas, worked assiduously to gather the information given in these articles. It is now "diffused" as Sam Houston expressed it, throughout the field of plumbing and sanitation.

Messrs. Giesecke, Reming and Knudson are here publicly commended for this contribution to the advancement of plumbing and sanitation.

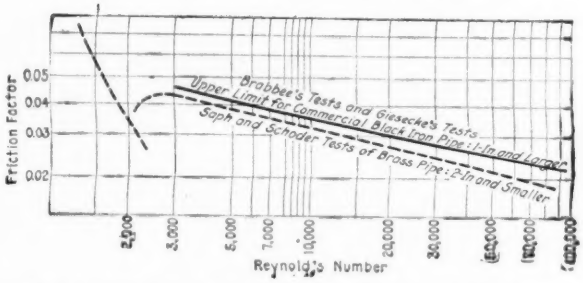


Fig. 8. Relation of friction factor to Reynold's number

"PROFESSOR Blasius probably made the earliest determination of this relation and published his findings, 1913, in Mittheilungen über Forschungsarbeiten, Vol. 131, from which the dotted line shown in Fig. 8 was reproduced. This line shows the relation between the friction factor, f, and Reynold's number for smooth brass pipe, based upon experimental determination by Professors Saph and Schoder, at Cornell University, published in Tr. A. S. C. E., 1903.

"It appears from Dr. Blasius' drawing that the brass tubing experimented with by Saph and Schoder and used by him in his investigation ranged in diameter from 1 inch to 2 inches.

"Professor Blasius also studied the experimental determinations by Saph and Schoder of the friction factor for galvanized pipe, but found so great a variation in these results that he concluded there was no definite relation between f and Reynold's number for other than very smooth pipes.

"The writer made a study of the experimental determinations by Dr. Brabbee and published in Gesundheits Ingenieur, 1913, and of the experimental results secured under his direction and published in University of Texas Bulletin No. 1759. Dr. Brabbee's tests were made with German commercial black iron pipe and covered a range of diameter from ¾ inch to 1½ inches, of velocity from 0.7 to 10 ft. per second, and of temperature from 60 degrees to 200 degrees F. The writer's tests were conducted with American commercial black iron pipe and covered a range of diameter ½ inches to 3 inches, of velocity from 0.05 feet to 3 feet per second, and of temperature from 64 degrees to 72 degrees Fahrenheit.

"A study of these two series of tests shows quite clearly that the relation of f to Reynold's number depends on the diameter of the pipe so that, for a given Reynold's number the value of f decreases as the diameter of the pipe increases. The reason for this seems quite evident. The inner surface of a commercial black iron pipe has a certain degree of roughness and the degree of roughness is probably about the same for a 1-inch pipe as for a 10-inch pipe. Relatively, a given degree of roughness has a greater effect upon the friction of water flowing in the 1-inch pipe than on the friction of water flowing in the 10-inch pipe because the volume of water flowing per unit area of pipe surface is ten times as great for the 10-inch pipe as it is for the 1-inch pipe.

"It seems that for a given Reynold's number, the friction for a 10-inch pipe should be smaller than for a 1-inch pipe; in other words, a 10-inch pipe is, relatively, more nearly 'perfectly smooth' than a 1-inch pipe.

"This view is corroborated by a study of the friction factors published in Fanning's Treatise on Hydraulics and Water Supply Engineering, fifteenth edition, pp. 242-245, as shown in Fig. 9.

"In preparing this figure it was assumed that Fanning's values apply at some average temperature, and 70-degrees was selected as the temperature for which Reynolds' numbers were calculated.

Velocities were selected, varying from 0.2 to 4 ft. per second, and diameters, varying from 1 to 36 inches. The diagram shows clearly that, if Fanning's values are correct, the friction factor decreases as the pipe diameter increases, for a given Reynolds number.

"Since this conclusion differs materially from that arrived at by the authors of a paper on 'Flow of Fluids Through Commercial Pipe Lines,' pub-

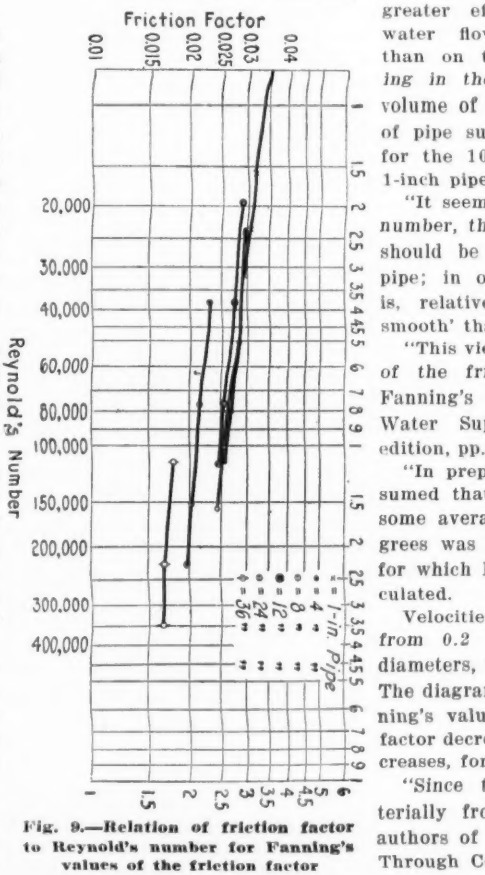


Fig. 9.—Relation of friction factor to Reynold's number for Fanning's values of the friction factor

lished in Engineering News-Record, October 26, 1922, it seems well to call attention to the discrepancy in order that additional research may be conducted, if necessary.

"According to the writer's views, it is impossible to draw a single curve in Fig. 8 from which the friction factor for the entire range of pipe diameters can be determined and, therefore, only one curve is shown, the full line, from which the friction factor for 1-inch commercial black iron pipe can be found according to experimental determinations by Dr. Brabbee and by the writer. For larger pipe diameters, corresponding curves should be drawn below the one shown; how far below, the writer does not know.

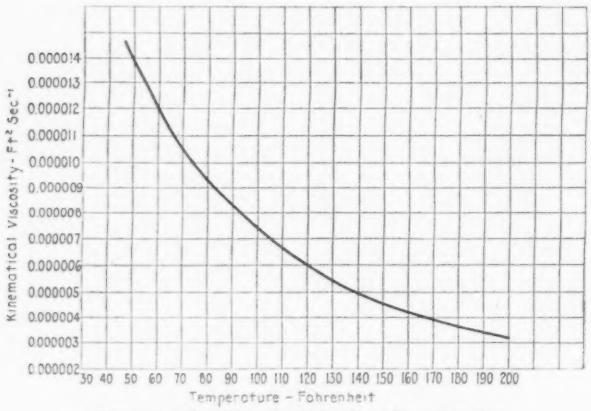


Fig. 10. The kinematical viscosity of water

"If it were certain that the dotted line shown in the figure, applied to all smooth brass pipes, no matter how large the diameter, we could conclude that no curve giving the friction factor for commercial black pipe could lie below the dotted line and we could assume (in the absence of definite information) that a certain large pipe, a 24-inch pipe, for example, could be considered 'smooth' and that its curve should coincide with the dotted line of Fig. 8 and that, as the pipe diameter is gradually increased from 1 inch to 24 inches, the corresponding curve is gradually moved from the full line of Fig. 8 to the dotted line of that figure. However, it is entirely possible if careful tests were made with very large smooth brass pipe, that a curve may be found giving lower values of f than those shown by the dotted line of Fig. 8, and, consequently, it is also possible that lines showing the values of f for large commercial black iron pipe may lie below the dotted line of Fig. 8.

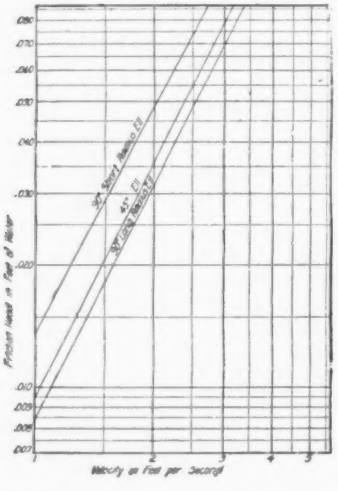


Fig. 11.—Friction heads in 1¼-inch elbows, as actually determined and as shown by the three individual points in Fig. 12. If this diagram had been drawn to represent the average values shown by the full lines of Fig. 12 or those shown by the lines in Fig. 2, the 45-degree elbow line would have been slightly below the long radius 90-degree elbow line

"In order to apply the data available at the present time, to determine the effect of temperature upon the friction of water in pipes, the writer prepared Table A and Fig. 10, giving the kinematical viscosity of water at various temperatures. These values were deduced from the values of the densities and viscosities of water as given in the Landolt-Bornstein tables.

"To explain the application of the data to the solution of practical problems, let it be required to find the friction head in a 1-inch black iron pipe, when the water is flowing with a velocity of 2 ft. per second and when the temperature is (*a*) 60 degrees F. or (*b*) 180 degrees F.

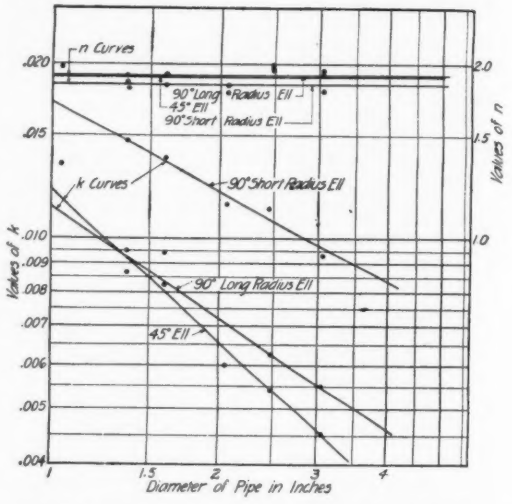


Fig. 12. Points showing the actual experimental values and lines showing the average values of k and n, in the formula: $h = k\,v^n$, as determined in this investigation. The experimental value of k for the 1½-inch elbow is evidently too high. See note under Fig. 11

"The diameter of a 1-inch pipe is 1.049 inches or 0.0874 ft. Reynold's numbers for the two cases are:

$$\frac{v\ d}{kv} = \frac{2 \times 0.0874}{0.00001207} \text{ or } 14{,}500 \text{ and } \frac{2 \times 0.0874}{0.00000362} \text{ or } 48{,}300$$

and the corresponding values of f (from Fig. 8) are 0.032 and 0.025.

"The corresponding friction heads are

$$\left(\text{from } h = f\frac{l}{d}\frac{v^2}{2g}\right)$$

0.023 ft. of 60-degree water and 0.018 ft. of 180-degree water, per ft. of pipe."

Table A

The Kinematical Viscosity of Water at Various Temperatures*

Temperature Deg. Fahr.	Kin. Visc. Ft.² Sec.—¹
50	0.00001397
60	0.00001207
70	0.00001054
80	0.00000928
90	0.00000823
100	0.00000735
110	0.00000660
120	0.00000596
130	0.00000494
150	0.00000454
160	0.00000419
170	0.00000389
180	0.00000362
190	0.00000337
200	0.00000312

*Translated and compiled by the writer from tables of densities and viscosities published, Landolt-Bornstein. Physikalisch Chemische Tabellen.

In further explanation of this method, the determination of the coefficient for line F_2, Fig. 7 in terms of 70-degrees F. water is reproduced here:

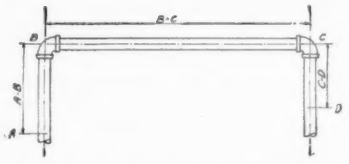


Fig. 13.—A diagram to describe the "no length" elbow

The temperature of the water used in obtaining Line F_2 was 81 degrees F. The values of the kinematical viscosities for 81 degrees F. and 70 degrees F. are, respectively, 0.0000092 and 0.0000105. Reynolds' number for a temperature of 81 degrees F., a velocity of 1 ft. per second, and a diameter of 1.60265 inches (nominally 1½ inches) or 0.13355 ft., is $1 \times 0.13355 \times 0.0000092 - 1 = 14{,}525$. Reynold's number for the same velocity and diameter, but temperature of 70 degrees F., is 12,720. The corresponding values of f from the curve of Fig. 8 (drawn to an enlarged scale) are 0.0325 and 0.0333, and their ratio is 1.02461.

From these data, the value of the coefficient modified for 70-degree water, is found to be 1.02461×0.7185 or 0.7362.

Substituting the modified values of n and k in Eq. 2, the modified equation is

$$h = 0.7362\ v^{1.842} \quad \ldots\ldots (3)$$

The equation of line F_1, Fig. 7, Eq. 1, corrected as described above for a temperature of 70 degrees F., is

$$h = 0.5579\ v^{1.838} \quad \ldots\ldots (4)$$

Having found Eqs. 3 and 4, the values of h were calculated from both equations for velocities of 1, 2, and 3 ft. per second; the differences of the respective values of h were divided by 13 and plotted. The resulting line is shown in Fig. 11 and represents the friction in one 1½-inch, 90 degree short radius elbow. Its equation is

$$h = 0.0137\ v^{1.846} \quad \ldots\ldots (5)$$

Having thus found the friction in one short radius elbow, the "set-up" was changed by substituting 17 long radius 90-degree elbows for the 17 short radius elbows.

The test was repeated as described above and the data shown in Table III and by line F_3, Fig 7, were secured.

The equation of this line, corrected for temperature, is

$$h = 0.6428\ v^{1.860} \quad \ldots\ldots (6)$$

From this equation the values of h for velocities of 1, 2, and 3 ft. per second were calculated and subtracted from the corresponding values calculated from Eq. 3.

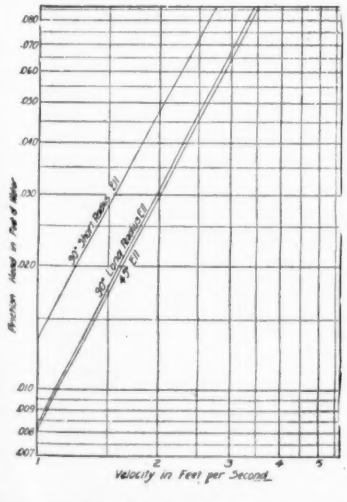


Fig. 14.—The friction heads in "no length" elbows, as determined from the average values shown in Fig. 12

The differences between the respective values, divided by 17, gave the difference between the friction of one 90-degree short radius elbow and one 90-degree long radius elbow.

Subtracting these differences from the corresponding values for a 90-degree short radius elbow gave the friction in one 90-degree long radius elbow.

These values are shown in the 90-degree long radius elbow line of Fig. 11. The equation of this line is

$$h = 0.0082\ v^{1.926} \quad \ldots\ldots (7)$$

Having completed this determination, the "set-up" was changed to that shown by Fig. 5, in which the 17 long radius 90-degree are replaced by 17 45-degree elbows.

Following the method outlined above, the data shown in Table IV and by line F_4, Fig. 7, were secured.

The equation of this line, corrected for temperature, is

$$h = 0.6629\ v^{1.862} \quad \ldots\ldots (8)$$

Using the same method as that described for the long radius elbows, the line for the 45-degree elbows was determined as shown by Fig. 11.

The equation of this line is

$$h = 0.0094\ v^{1.920} \quad \ldots\ldots (9)$$

Similar calculations were made for each pipe size and the values of k and n, shown in Table V, were determined. These values were plotted against the actual internal diameter of the pipe as shown in Fig. 12.

The average lines for n and k, for each type elbow, were drawn and their equations determined.

From the data of Table V and from Fig. 12, k seems to be a function of the diameter, while n seems to be constant for each type of elbow.

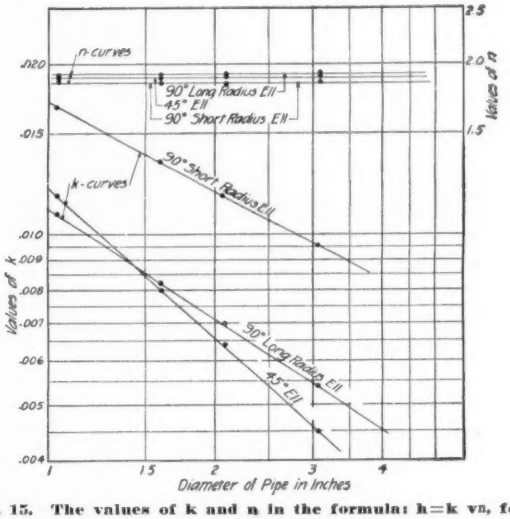


Fig. 15. The values of k and n in the formula: $h = k\ v^n$, for "no length" elbows, as determined from the average values of Fig. 12

The values of k determined from these lines are shown by the following equations:

Short radius 90-deg. elbow: $k = 0.01725\ d^{-0.524}$ . . (10)

Long radius 90-deg. elbow: $k = 0.0114\ d^{-0.656}$ . . (11)

45-degree elbow: $k = 0.0122\ d^{-0.886}$ . . (12)

where d = the actual internal diameter, in inches, of the pipe having the same nominal diameter as the elbow.

From the lines of Fig. 12 the values of n are 1.85, 1.92, and 1.90, respectively.

The final general equations of one elbow are, therefore:

Short radius 90-degree elbow:

$$h = 0.01725\ v^{1.85}\ d^{-0.524} \quad \ldots\ldots (13)$$

Long radius 90-degree elbow:

$$h = 0.0114\ v^{1.92}\ d^{-0.656} \quad \ldots\ldots (14)$$

45-degree elbow:

$$h = 0.0122\ v^{1.90}\ d^{-0.886} \quad \ldots\ldots (15)$$

The "No-Length" Fitting

In order to distinguish properly between the friction of a long radius elbow and that of a short radius elbow, it is necessary to consider the difference in the length

Tables on the Friction of Water in Elbows

Table I

91 ft. of 1½-inch Pipe and 4 90-Degree Short Radius Elbows
Water Temperature 80 Degrees F.

h in cm.	W. in lbs.	Time—sec.	Vel.—ft./sec.
124.8	100	38.8	2.954
105.7	100	42	2.729
100.5	100	43	2.665
95.6	100	44.8	2.558
88.5	100	46.2	2.481
74	125	63.8	2.245
64	100	55.2	2.076
55	100	60	1.91
47	100	65.8	1.742
46.2	100	66.4	1.726
38	100	73	1.57
37	100	74.6	1.536
20.8	100	101.2	1.132
20.3	100	102.8	1.115

Table II

91 ft. of 1½-inch Pipe and 17 90-Degree Short Radius Elbows
Water Temperature 81 Degrees F.

h in cm.	W. in lbs.	Time—sec.	Vel.—ft./sec.
134.74	100	43.13	2.657
109.7	100	48	2.388
108.46	100	48.26	2.375
93.56	100	52.26	2.193
83.76	100	55.4	2.069
63.62	100	64.4	1.779
37.55	100	85.8	1.335
17.93	100	127.26	.900
11.81	50	80.2	.714

Table III

91 ft. of 1½-inch Pipe and 17 90-Degree Long Radius Elbows
Water Temperature 90 Degrees F.

h in cm.	W. in lbs.	Time—sec.	Vel.—ft./sec.
131.75	100	41.2	2.782
128.7	100	41.4	2.768
104.33	100	46.25	2.478
91.18	100	49.53	2.314
82.36	100	52.9	2.166
74.3	100	55.4	2.068
53.83	100	66	1.736
50.26	100	68.61	1.670
28.6	100	92.6	1.237
17.25	100	121.6	.942
17.1	50	61.2	.936

Table IV

91 ft. of 1½-inch Pipe and 17 45-Degree Elbows
Water Temperature 83 Degrees F.

h in cm.	W. in lbs.	Time—sec.	Vel.—ft./sec.
132.1	100	41.6	2.755
130.8	100	41.8	2.742
130.45	100	41.73	2.746
105.3	100	46.8	2.449
87.5	100	51.4	2.23
51.16	100	66	1.737
35.95	100	83.13	1.378
17.78	50	60.8	.943
16.75	100	124.2	.923

Table V

k and n values

Nominal D.	D.	90-degree S. R.		90-degree L. R.		45 Degrees	
		k	n	k	n	k	n
1	1.04249	.013366	1.977	.....	....	.....	....
1¼	1.36582	.014736	1.861	.009508	1.914	.008566	1.717
1½	1.60265	.013713	1.846	.008223	1.926	.009405	1.920
2	2.05608	.011462	1.845	.....	....	.006089	1.788
2½	2.47585	.011225	1.977	.006253	1.953	.005388	1.996
3	3.05657	.009313	1.803	.005683	1.914	.004703	1.939

Table VI

k and n values.
"No-length" fitting

Nominal D.	D.	90-degree S. R.		90-degree L. R.		45 Degrees	
		k	n	k	n	k	n
1	1.04249	.016773	1.851	.010888	1.915	.01169	1.891
1½	1.60265	.013383	1.848	.008179	1.923	.007975	1.897
2	2.05608	.011746	1.843	.006973	1.922	.006395	1.896
3	3.05657	.009542	1.852	.005371	1.935	.004496	1.909

Table VII

Ratios of Friction Heads of Long Radius 90-degree and 45-degree Elbows to Short Radius 90-degree Elbows at Velocity of 1 ft. per Second

Size	Short Radius	Long Radius	45 Degrees
1	1.000	0.657	0.697
1¼	1.000	0.634	0.632
1½	1.000	0.621	0.596
2	1.000	0.601	0.545
2½	1.000	0.586	0.509
3	1.000	0.570	0.472

Table VIII

Ratios of Friction Heads of Long Radius 90-degree and 45-degree "No-Length" Elbows to Short Radius 90-degree "No Length" Elbows at Velocity of 1 ft. per Second

Size	Short Radius	Long Radius	45 Degrees
1	1.000	0.649	0.697
1¼	1.000	0.627	0.633
1½	1.000	0.614	0.597
2	1.000	0.595	0.545
2½	1.000	0.580	0.510
3	1.000	0.565	0.472

of the two fittings. To do this, the writers suggest the adoption of the "no-length" fitting concept, proposed in University of Texas Bulletin, No. 1759, p. 18.

Referring to Fig. 13, if the distances AB, BC, and CD are measured on the center lines of the pipe and the friction due to the pipe line is determined on the basis of this length, and if to this is added the friction of the elbows B and C, more friction is calculated than is actually present. To obviate this error, the friction in the length of pipe replaced by the elbow may be calculated and subtracted from the friction of one elbow. The result is the friction of the "no-length" elbow.

Using the pipe friction values published in University of Texas Bulletin, No. 1759, and considering the length of an elbow as twice the distance from the center line intersection to the beginning of the thread, the friction due to that length of pipe was calculated and subtracted from the values of the friction of one elbow as determined above. The resulting differences are the theoretical values of the friction in "no-length" elbows.

The method of determining these values is as follows:

From University of Texas Bulletin, No. 1759, the friction in one foot of pipe is:

$$h = 0.00685\ v^{1.77}\ d^{-1.275} \qquad (16)$$

The length of a 90-degree, short radius, 1½-inch elbow, measured as outlined above, is 0.208 ft.; the length of a 90-degree long radius elbow is 0.437 ft.; and the length of a 45-degree elbow is 0.135 ft.

Using these values for length, and the actual pipe diameter of 1.6026 inches, the values of friction were determined for velocities of 1, 2, and 3 ft. per second. These values were subtracted from the corresponding values of

the friction in the short radius 90-degree elbow, the long radius 90-degree elbow, and the 45-degree elbow. The differences are the friction values of the theoretical "no-length" elbows.

Taking the short radius 90-degree elbow as an example, these values, plotted against velocity in Fig. 14, gave a straight line from which a new equation was determined. The equation of this line is:

$$h = 0.13383\ v^{1.848} \quad \ldots\ldots (17)$$

Using the same method, equations for the 90-degree long radius and the 45-degree elbows were determined for the various pipe sizes and the resulting values of k and n, shown in Table VI, were plotted in the series of curves in Fig. 15.

As before, k is a function of the diameter and n is a constant for each type of elbow. The final general equations for the friction in the theoretical "no-length" fittings are:

Short radius 90-degree elbow:

$$h = 0.01715\ v^{1.85}\ d^{-0.527} \quad \ldots\ldots (18)$$

Long radius 90-degree elbow:

$$h = 0.01120\ v^{1.922}\ d^{-0.657} \quad \ldots\ldots (19)$$

45-degree elbow:

$$h = 0.01215\ v^{1.896}\ d^{-0.89} \quad \ldots\ldots (20)$$

By comparing Eqs. 14 and 15 with Eq. 13, the relative friction in short radius 90-degree elbows, long radius 90-degree elbows, and 45-degree elbows may be calculated for any desired velocity. This was done for a velocity of 1 ft. per second and the results, expressed in terms of the friction in one short radius 90-degree elbow, are shown in Table VII.

Similar calculations were made from Eqs. 18, 19, and 20 for "no-length" elbows. The results are shown in Table VIII.

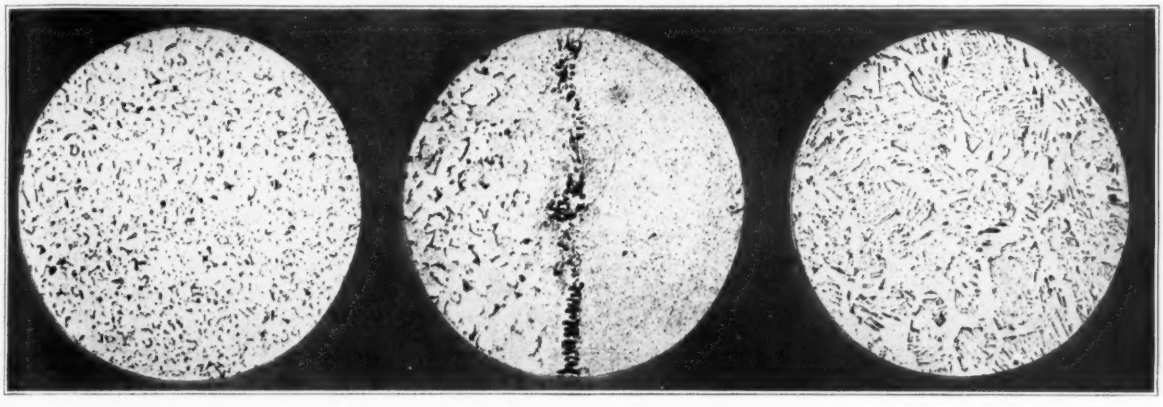


Fig. 1.—Section of base metal, showing the uniform small-grained structure of the tubing. The dark areas are pearlite, which is the mode of occurrence of carbon in steel

Fig. 2.—Section through weld made with strips cut from the tubing for welding rod. Base metal is at left; weld metal at right. The weld metal contains very little carbon as indicated by the absence of pearlite. Between base metal and weld metal is a band of oxide indicating that thorough fusion was not obtained. This band is not present in good welds

Fig. 3.—Section of weld metal with high test rod. The weld contains about the same amount of carbon as the base metal and is free from inclusions or oxide bands

High Quality Welding Rod for Strong Welds

EXPERT welders claim that the average tensile strength of welds in many instances can be increased greatly through the use of high-grade welding rod of proper composition. Because of this, the use of high-strength welding rods is usually thought of in connection with applications where strength is a major factor. But the increased strength is a direct result of the superior structure and uniformity of welds produced with such a rod. A high percentage of silicon and manganese effectually cleans the finished weld of oxide or slag inclusions. That is, welds made with rods of such composition have superior quality as well as high strength. Of course, so far as the welds themselves are concerned, these two factors are almost synonymous, but from the viewpoint of application they may sometimes be quite independent.

To illustrate, one of the new types of domestic refrigerating units proving so popular of recent months must operate under a vacuum. Obviously all joints in the system would have to be perfectly tight. High-grade seamless tubing of 1-inch diameter and 14-gauge wall thickness was chosen for piping, the joints to be made by oxwelding. Welds made with this unusual steel welding rod had excellent appearance and ample strength, but when tested for ability to hold a vacuum were occasionally found to be slightly porous. In spite of every precaution, some of the welds continued to show porosity. Here then was an instance where the strength was satisfactory, but still the quality of the weld metal did not uniformly come up to the severe requirements. Emphasis was on quality rather than on strength.

Laboratory investigation showed that the trouble was probably due to traces of oxide between the weld metal and base metal. It is very difficult to melt such thin metal, particularly in the form of small diameter tubing, without making large holes. Consequently the welders are tempted to use too little heat rather than too much, and the result was imperfect fusion and failure to eliminate the particles of oxide which would form at times.

High test rod was recommended to solve this difficulty. Its self-fluxing nature would automatically clean up the joint. Furthermore, it flows easily and sparks very little. As expected, the oxide disappeared completely from the joint.

As shown in the photomicrograph, Fig. 3, the weld became uniform throughout, free from inclusions or oxide bands and contained about the same amount of carbon as base metal. The silicon and manganese in the high test rod had eliminated any oxide from the weld and thus greatly improved its quality, enabling it to meet the most exacting requirements in production.

QUESTIONS

ASKED BY OUR READERS AND ANSWERED BY OUR EXPERTS

The Questions and Answers Department is open to all readers. Here their questions are answered—their problems solved. And, what is more, this department is an open forum, where readers may discuss plumbing and heating subjects. Don't hesitate to ask questions about the things you want to know, and don't fail to send in your comments and criticisms of questions that have been answered. While all questions are answered by men who are expert in their particular lines, your experiences may help a fellow craftsman who is in need of information. This department is for the craft. Use it freely. There are many ways to untie knotty problems.

DOMESTIC HOT WATER SUPPLY DOES NOT WORK RIGHT

Editor, "Domestic Engineering":—The accompanying sketch, Fig. 1, shows the layout of a hot water supply system, which I installed in a two-story residence some time ago.

This system does not deliver enough hot water to the

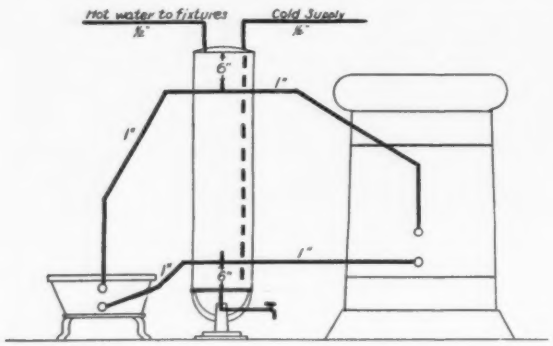


Fig. 1

bath on the second floor; not even when the laundry stove has been fired for two hours and the water seems to be boiling hot. When the bath faucet is opened, it will supply several gallons of hot water, then cold water, and after that it will continue to supply hot and cold water alternately.

Where have we made a mistake?

Missouri. A. B. P.

Fig. 1 shows the installation of bullheaded tees on the supply, which is not good practice, and we would advise changing the connections so that one water front will be connected to tank through present openings and the other be connected into the piping above the tank.

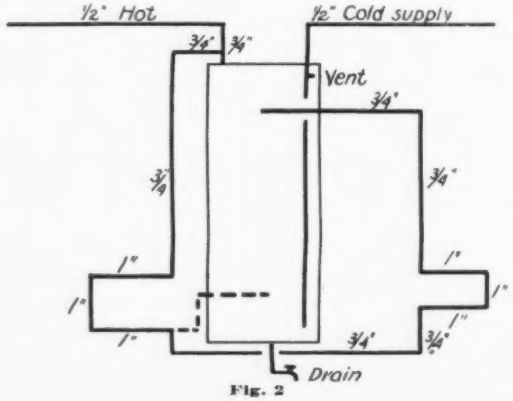


Fig. 2

We would also suggest that a careful examination be made of the cold water supply tube, so as to be sure that the tube is in place and that the vent hole in the tube is not too large.

If you prefer, one return could be made to the tank through the lower side opening, in which case it would be advisable to install a drain valve at the lowest point of that connection. See Fig. 2.

HOW TO MAKE WARM AIR FURNACE HEAT FOUR RADIATORS

Editor, "Domestic Engineering":—We have four hot water radiators connected to a warm air furnace with a 1¼-inch main and 1-inch risers to radiators 22 ft. above auxiliary hot water heater. The expansion tank is 22 inches above the radiators.

The water heats up the two radiators closest to the expansion tank first, then all the heat leaves them and goes to the other two radiators. Never at any time do all the four radiators heat equally well.

Can you tell me how we can remedy this defect?

Montana. C. H. W.

With the information given, we conclude that your trouble lies in the fact that your main supply is too small for the branches. It is an established fact that the size of a heating main is ascertained by determining the size and area of the valves to be used for each radiator connected to that main. The combined valve area will be the area of the main to use.

The area of a 1¼-inch pipe is 1.50 square inches and the area of a 1-inch pipe is .85 square inch.

For the four radiators, with 1-inch connections, you will have a total of 3.40 square inches or a trifle more than the area of a 2-inch pipe which is 3.36 square inches.

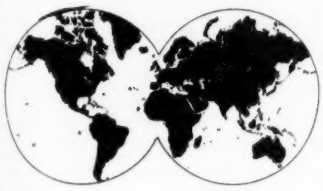
With ¾-inch connections at the radiators, you would have a total area of 2.00 square ft., which is also the area of a 1½-inch pipe.

We suggest changes to conform; that is, a 1½-inch main with ¾-inch branches and valves to the radiators; better yet, a 2-inch main with ¾-inch branches and valves on three radiators and a 1-inch branch and valve for the radiator at the terminal of the main.

The connection to the expansion tank should be made at the lowest possible point in the return line.

The Mayer Godchaux Co., Inc., 718 Poydras street, New Orleans, La., has been awarded the plumbing and heating contract in a building at 634 Magazine street.

This photograph shows a Marine plane about to carry a bathtub to Panama. Not only trade, but sanitation, "follows the flag"



American Plumbing Goods Abroad

Mexico, West Indies and Central America

By J. W. PALMER

Article No. 2

AMERICAN plumbing fixtures find their greatest sale in those areas lying between the southern boundary of the United States and the northern boundary of Colombia and in the islands comprising the West Indies; Cuba and Mexico, the first and third largest outlets in all the world, being easily the principal markets of the area. The region is distinctly a consuming market; that is, there is no manufacture of plumbing fixtures as we know them carried on anywhere within its boundaries unless we consider the limited manufacture of portable tubs of light galvanized sheets or the building of cement or tile fixtures erected simultaneously with the rest of the dwelling as the manufacture of these fixtures. The demands of the area, however, are much less diversified than its importance as an outlet for American fixtures would seem to indicate, and several types of fixtures find little or no sale within its confines.

Because of the distinctly hot and very humid climate which prevails over most of the Central American-West Indian region, there is a very distinct preference shown for bathing by the shower bath method—a preference which is conspicuously reflected in the rather limited sales of bathtubs—and one which permits of frequent bathing with greater ease than when a tub is employed.

Numerous city ordinances and regulations throughout the whole of the area which prohibit the use of outhouses within its towns and cities, rather favor the sale of toilet fixtures, although, on the other hand, the rather uncertain and often unreliable water supply systems of these same towns tends to restrict their use.

The lavatory, however, is distinctly a popular fixture and, in a great deal of the territory, might well be described as the favorite because, first, it is usually the first fixture to be purchased when the house owner decides to "go in for" plumbing and, second, because he not infrequently has them installed in his dining room and perhaps in his dressing room in addition to in his bathing room—"bath rooms" not being at all the rule.

On the other hand, there is almost no market for laundry trays as we know them. Usually when the clothes of

the household are to be washed they are entrusted to washerwomen who either take them to their homes and wash them in portable tubs or who carry them to the nearest and most convenient river or stream and there soak and pound the dirt out of them. Of course, where the household is large and wealthy the washing is frequently done on the premises, but nothing so fine as the familiar stationary tub is employed; a tile or cement tank, usually called a "pila," and set up in the patio or yard of the home, serving both as a wash tub and water storage tank as occasion demands. Kitchen sinks, especially in urban areas provided with supplies of running water, will quite frequently be found and are probably, after the lavatory and closet, the most popular plumbing fixtures.

Because there are as yet but few bath rooms the sale of bathroom accessories has not reached any considerable figure, though it is stated that this trade is steadily increasing from year to year. The trade in water heaters, however, is virtually non-existent except in the higher regions of northern and central Mexico, where limited numbers of wood burning or electric heaters are installed.

It seems highly probable that this Central American-West Indian area will continue to be an important market for American plumbing. Its limits have by no means been reached nor even determined with any degree of definiteness and, in view of the seemingly general tendency to improve existing water supply arrangements and to set up new systems where none now exist, and to expand the sewerage systems of many of the towns of the area, these as yet undetermined limits would seem about to undergo a considerable expansion. There is, however, that distinctly limiting factor present in the relatively low purchasing power of the larger part of the population which must be reckoned with, but there are sufficient numbers of those who can afford modern plumbing who are yet without it to keep this area among the important outlets for American plumbing.

EXPORTS OF AMERICAN PLUMBING

AS STATED at the beginning of this article, the value of the American plumbing fixtures exported to this area in 1925 or 1926 was greater than that to any other similar market and might well be said to equal in value the trade with the rest of the world. Of a world total of $2,266,529 of value in plumbing fixtures exported from the United States during 1926, fixtures valued at $1,098,713 went to the various markets of this area alone—an amount equal to 48.5 per cent of the whole.

Despite the often stated preference of the area as a whole for fixtures of enameled iron because they were less likely to suffer breakage in transit and because their lighter weight reduced transport and import charges, fixtures valued at $564,513 out of the total of $1,098,713 of all classes of fixtures were earthenware, and only $534,200 were enameled iron.

Unfortunately it is impossible to discover just what type of fixtures is in principal demand other than to say that $284,998 of the total of $534,200 represented enameled iron bathtubs and the remaining $249,202 represented the value of the shipments of all of the other enameled iron fixtures which could not be termed bathtubs. The value given above as that of the earthenware fixtures shipped to this market cannot be broken down into smaller classifications and so must be considered to include all types of fixtures not made of enameled iron.

In this connection it might be interesting to note that of the plumbing fixtures valued at $1,000,334 and exported in 1925, fixtures valued at $467,855 were of earthenware, while $247,772 was the value of enameled iron bathtubs, and the remaining $284,707 representing the value of the unenumerated enameled iron fixtures sold.

In view of the accompanying chart it is scarcely necessary to comment upon the relative sizes of the various markets of this area. It might be well to note, however, that in the Cuban market the sales of earthenware fixtures, $366,116 in 1926, exceeded those of enameled iron by nearly $100,000, and that in this last group the value of the bathtubs sold was almost three times as great as that of all other fixtures of this group. The Mexican market tended to point in the other direction with shipments of enameled iron fixtures exceeding those of earthenware by almost $50,000—five-eighths of the enameled iron being lavatories and other fixtures not to be classified as bathtubs. The remainder of the markets are of much smaller extent—those of Panama ($32,131) and Bermuda ($25,294) being the most valuable.

CHARACTERISTICS OF THE CUBAN MARKET

AS WILL be noted from the accompanying illustration, the island of Cuba constitutes the largest single outlet for American plumbing fixtures—in fact, shipments in 1926 to Cuba made up 28 per cent of the total to all markets. The trade in 1926, however, was less valuable than in 1925, the shipments during the earlier year having been valued at $653,865, as against $635,810 in the later year. In each case the value of the shipments of earthenware fittings exceeded those of enameled iron, which last declined rather sharply in 1926 as against 1925, and resulted in a reduction in the value of the whole trade which the increase in the shipments of earthenware fixtures was insufficient to offset.

As in most of Central America and the West Indies, the shower bath is preferred to the tub bath in Cuba, so that much greater numbers of the former are sold than of the latter. However, the trade in bathtubs in 1926 was valued at nearly $200,000. The preferred type of tub is of enameled iron, five or five feet six inches in length, and usually provided with feet; the number of built-in tubs being about one to every ten of the foot-equipped type.

Toilet facilities are provided in all of the better homes in Cuban cities, though in the country districts outhouses are invariably provided. The fixture preferred consists usually of a porcelain or china bowl, a low tank, and a wooden seat finished to correspond with the tank. The water usually reaches the fixtures at street pressure, but here it is quite customary to have an elevated tank filled in reserve against possible shortage.

The kitchens in the majority of the city homes of Cuba wherever running water is provided, have sinks installed. The local preference is for a sink approximately 16 by 24 inches in size and without having a drain board as a component part, although a majority have wooden boards erected jointly with the sink which is usually of enameled iron of American manufacture, though of late there have been increasing numbers of light, German sinks sold. Laundry trays, however, do not form a part of the equipment of the Cuban kitchen or, for that matter, of the Cuban household, for practically all of the laundry from the better homes is taken to and washed in the homes of the poorer classes. Lavatories, likewise, are in much less general use than might be expected and, while appreciable numbers of vitreous china lavatories are installed, the old style pitcher and bowl set still predominates.

Urinals of British manufacture and principally of the wall-hanging type find fairly extensive use in the public or semi-public buildings of Cuba. The sale of bidets is also fairly extensive, but is confined almost entirely to the districts in and about Habana. The greater part of these last are of American manufacture.

All sorts of bathroom accessories find fairly general, though not extensive, sale throughout Cuba, the preference being for those finished in nickel or white enamel, and practically all of these fittings sold are of American manufacture. Nickel-plated faucets and other fittings find the widest sale, though it should be noted that there is considerable demand for fittings of polished brass. The replacement trade, however, is small, as local practice does not make for too exacting upkeep so long as the fitting functions at all.

The number of water heaters installed is, as might be expected, very limited and their use is confined almost entirely to the city of Habana. It might be well to note here that this same condition obtains over the rest of the West Indies as well, as the climate is generally such that bathing in cold water is to be preferred over that in warm or hot.

MEXICANS USE MANY LAVATORIES

MEXICO is the second largest market of the Central America-West Indies region, and is the third largest market for American plumbing in the world, being exceeded only by Argentina and by Cuba. Despite unfortunate economic conditions during 1926, the value of plumbing fixtures exported to Mexico in that year, $276,638, was greater by $90,000 than the trade in 1925, which had totaled only $183,461. In contradistinction to the trade with Cuba and with Canada, the preponderance of the sales to Mexico were of enameled iron, with the shipments of lavatories, sinks and such products exceeding the number of sales of bathtubs by comfortable margins.

Bathing in Mexico is divided between the use of tubs in the cities of the high central plateau and of showers in the coastal towns—the climate and humidity being the determining factor in the selection of the method of ablution. The preferred type of tub is of enameled iron and equipped with legs, as this type of fixture is both easier to transport and is cheaper in price than the built-in type. Many tub installations are supplied with showers—in fact, it is quite usual to have the dual installation where a tub is used at all, but by far the greater number of the showers installed are quite apart from any tub.

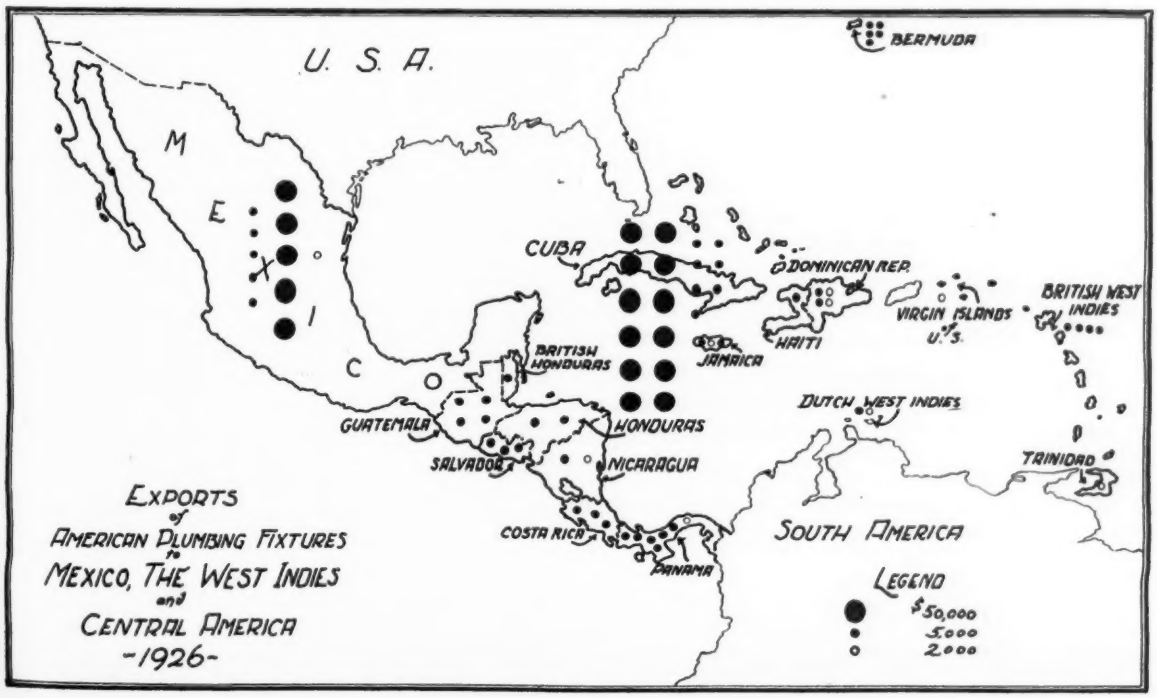
All of the better urban homes have toilet facilities within the buildings—water-flushed fixtures comprised of a china or porcelain bowl, a high tank, and wooden seat if in the higher interior, or a "celluloid" seat if for use in the coastal areas. The demand for urinals, however, is decidedly limited and is confined almost entirely to the wall-hanging type of fixture. There is a slight demand, however, for bidets which is met principally by fixtures of British manufacture.

As most of the kitchens in the urban homes, with the possible exception of those of Tampico, are supplied with running water, sinks of enameled iron are in quite general use. Usually these fixtures are quite large, averaging between 30 and 36 inches in length and 20 and 24 inches in width and frequently are provided with single drain boards. Laundry trays as such do not find any appreciable demand, for a locally made fixture of wood or cement serves the purpose adequately.

The lavatory might be described as the favorite plumbing fixture of the Mexican, as it is usually the first accessory to be installed. One local practice which tends to increase the number of these fixtures in use is that of installing an extra lavatory in the dining rooms and occasionally in the dressing rooms of the household whenever they can be afforded. The usual preference is of course for enameled iron fixtures as these are both less costly and less likely to become chipped or broken in transit. Bathroom accessories, however, are very little in demand, probably because bath rooms, as we understand the term, are not numerous.

Water heaters are seldom used in Mexico both because the general climate of the country does not make them necessary and because no Mexican city is supplied with gas at the present time. The heaters in use are almost entirely of local production and are heated either by wood or, in some instances, by electricity. American faucets, valves and pipe fittings, nickeled where exposed, predominate in the Mexican market. The majority of the fittings in use have the American thread.

(Continued on Page 70)



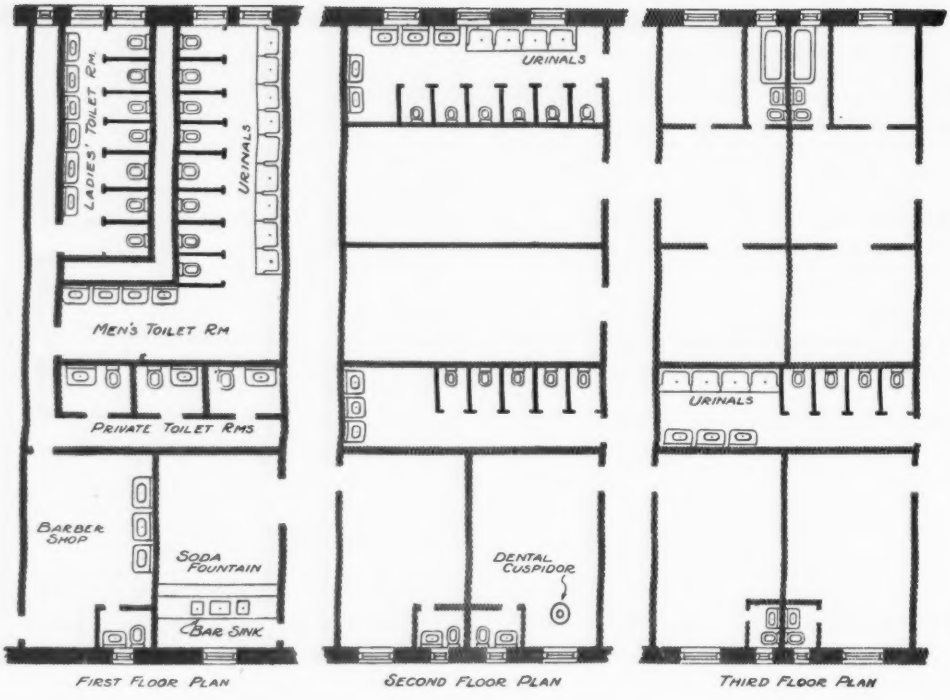


Fig. 1

The Schoolmaster Offers Suggestions on Problem Solutions

WE hardly ever go over the drawings sent in on one of the "Domestic Engineering" Plumbing Problems that we do not find one or more of them accompanied by a note stating that this is the first time that a drawing has been submitted, although the writer has been following the problems closely for a long time. We are always much pleased to receive this sort of a letter, for it shows that one more of our friends has seen the light, and reached a right decision in being willing to help the other fellow. There is no question whatever that the chap who works these problems out is getting very much more out of the work than the one who simply reads over the discussions. But that isn't the whole story. When a man sends in his work for discussion and criticism he is not only doing himself a good turn, and reaping benefit, but he is rendering a worth-while service to the hundreds who are studying these discussions.

Sometimes these first attempts bring forth quite a bit of criticism, and we have always felt that in a way it took courage for a man to send in a drawing made under his own name and to know that his work was going to be publicly criticised. Of course, initials instead of names of class members are used when requested. Nevertheless, we doubt whether there is a man who has done this thing and kept at it who has not been richly rewarded for his perseverance, even under the fire of criticism.

And we recall with sincere pleasure the names of many men who have come into this Class that "Domestic Engineering" has been conducting now for several years. Perhaps at first their work was crude, but after a time they were able to do work creditable not only as a drawing but as a first class plumbing layout.

When we know what this work has done in the past for many members of the Class, we must naturally have the keenest desire that its benefits should reach the largest possible number of our readers, and that is why we are urging you to participate actively in the work of the Class. Every one of you who desires to submit a solution of any one of our plumbing problems is cordially invited to do so.

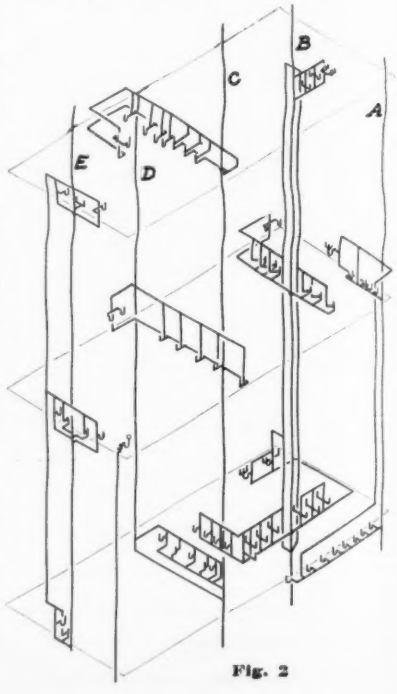


Fig. 2

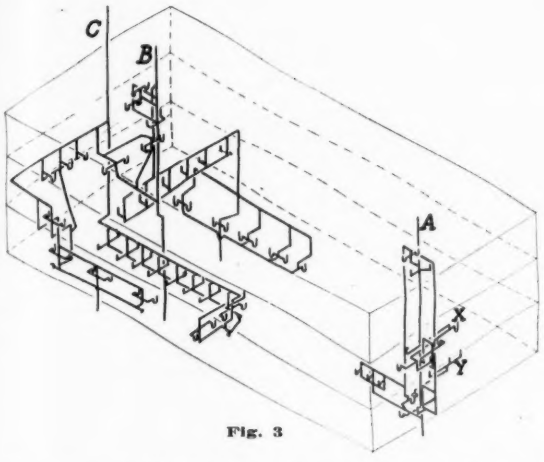


Fig. 3

Our present Plumbing Problem is the one shown on pages 38 and 39 of the June 11 issue, and the three floor plans on which the problem is based are here shown in Fig. 1.

Members of the Class submitting drawings relating to this problem are the following:

Fig. 2.—Alexander Smith, Cleveland, Ohio.
Fig. 3.—Wm. De Ronde, Paterson, N. J.
Fig. 4.—R. Zimmer, Bronx, N. Y.
Figs. 5, 6, 7, 8 and 9.—Wm. M. Glose, Jr., Allentown, Pa.
Figs. 10 and 11.—Louis Bodo, New Haven, Conn.
Figs. 12 and 13.—D. B. Biggs, Santa Ana, Calif.

Additional solutions will be published in a subsequent issue.

From our standpoint, our criticism can be much more definite and satisfactory when the drawing we are criticising and discussing is accompanied by the floor plans on which the elevation is based. Only four or five of these drawings are accompanied by the floor plans. In looking the sets of floor plans over we found that almost without exception the stacks on each set ran straight up, without offset. We thought best, therefore, to show of these floor plans only the first floor plan in each instance. By so doing considerable valuable space could be saved without sacrificing anything of value in the working out of the problem.

The original floor plans showed all plumbing fixtures located, but no stacks were shown.

THE PROBLEM

THE PROBLEM was to first locate the stacks according to your best judgment, and then to work out the complete plumbing elevation, either as a whole or in *separate sections. As will be seen, the* drawings submitted include both methods.

Following is a discussion of the drawings submitted:

From Cleveland, Ohio.

Fig. 2.—The original drawing from which our illustration is reproduced was an excellent piece of work. It is an isometric drawing, and it may be considered as having been drawn by viewing the work from the lower left hand corner. All of the isometric elevations that were submitted on this problem we believe were drawn in this same way, except Fig. 3, and this was drawn from the opposite corner—that is, from the lower right hand corner. One method is as correct as the other. Sometimes one or the other will show the work more clearly, but in this instance we do not know that there is much difference in this respect.

Whatever criticism we offer concerns the plumbing layout rather than the isometric features, for the drawing is O. K. as an isometric.

We note that there are two vertical vent stacks for stack B, and we do not just see why one would not have answered the purpose. Also, why would it not have been just as effective and much less expensive to run the loop vent for the line of urinals discharging into the foot of stack A into the vent stack for stack B, instead of running it as shown?

It looks to us as if, in the case of stack E, the fixtures on the second and third floors have been transposed.

The dental cuspidor is generally treated as an ordinary plumbing fixture, being trapped and vented in the usual manner. The soda fountain sink seems to have been overlooked.

From Paterson, N. J.

Fig. 3.—This is a good isometric drawing, but so much detail concerning size of fittings, catalog numbers of them, etc., has been written into the drawing that it makes the drawing so confused it is difficult to reproduce it just as originally intended. It would be much better in future to omit the detail. Each drawing must, of course, be redrawn in India ink in the art department of "Domestic Engineering."

We note two vent stacks serving stack A, one of these being used only for the soda fountain sink and dental cuspidor. It would seem as if one riser were sufficient. We believe the work on the top floor of stack A has been shown too high up, and that, as a matter of fact, it is shown on the roof instead of the third floor.

We presume the connections at X are for the dental cuspidor. Both waste and vent are very long and flat. We believe the best method of doing this work is to set the trap as near its stack as possible, under the floor, thus making the vent as short as it can be. Y repre-

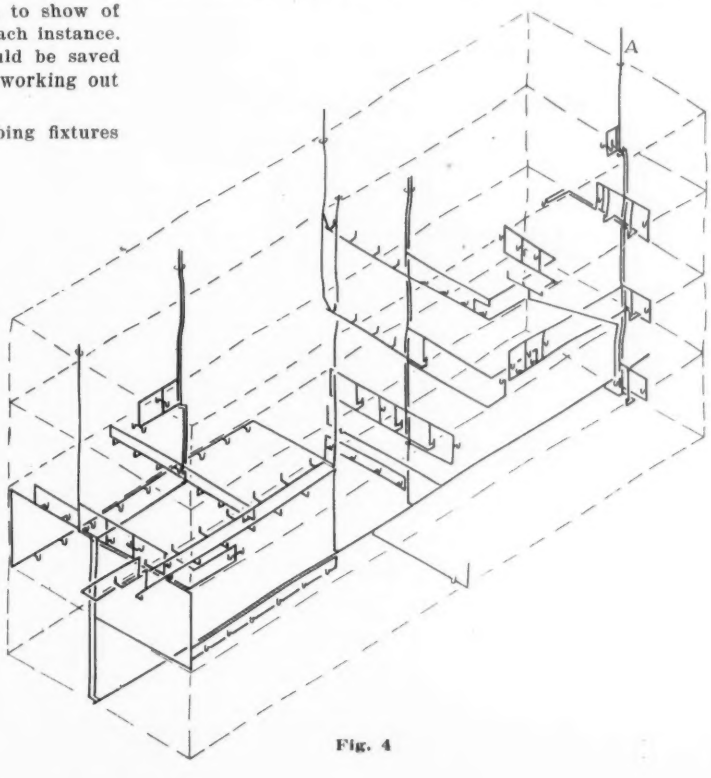
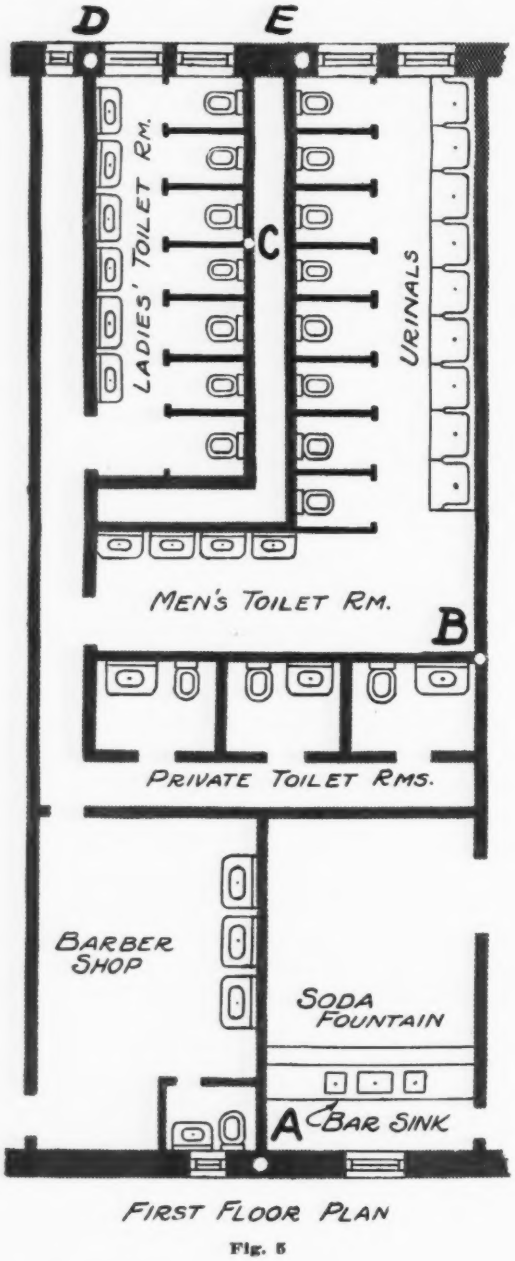


Fig. 4

sents the connections for the fountain sink, which discharges into a drain of some sort.

The work at the other end of the building, connected with the large toilet rooms, is well laid out. A part of the work which comes in between the two stacks B and C at one end, and stack A at the other end, seems to have been omitted. This is the work which includes the three private toilet rooms on the first floor, and the two large toilet rooms directly above on the second and third floors.



FIRST FLOOR PLAN

Fig. 5

From Bronx, N. Y.

Fig. 4.—Although no cellar plan was given in this problem, this drawing shows a house drain, with connections made into it, which, of course, makes the work more complete.

The soda fountain sink on the first floor discharges into a sink in the basement, and apparently a water closet and lavatory have been added in the basement.

The second floor plan shows three lavatories at the end of one of the large toilet rooms. These appear in the elevation, but in addition three other traps are shown, apparently in the same group, and no such work appears in the plans, so far as we can see.

Separating the men's toilet room from the ladies' toilet room on the first floor is a utility corridor, and apparently two horizontal lines of soil pipe are run in this corridor to accommodate the two lines of water closets on either side. We think this could be accomplished with one line, using double Y branches.

In the work for

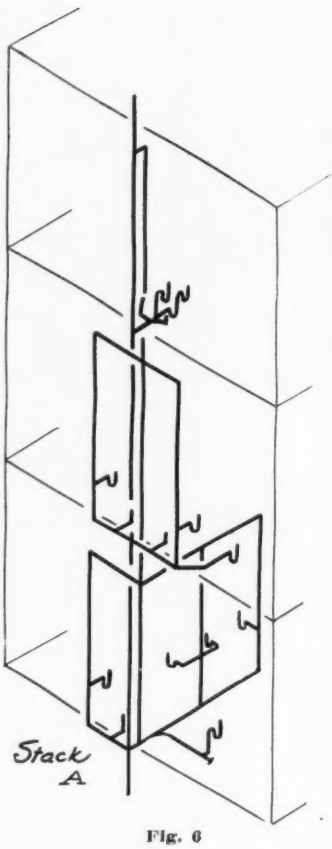


Fig. 6

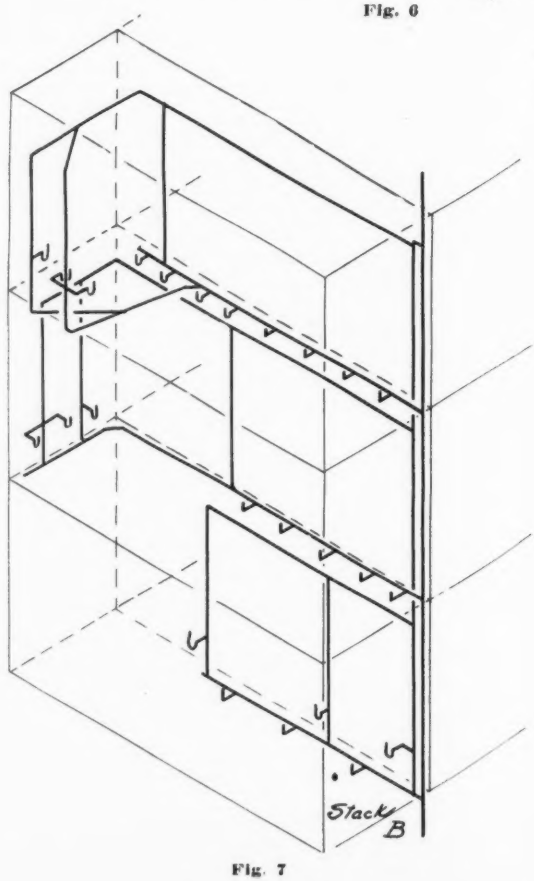


Fig. 7

Convert Any Boiler Into An Instant Hot Water Heater

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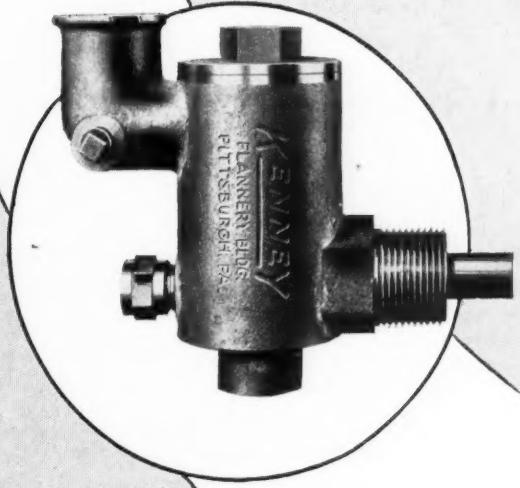

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Plumbing Fixtures

the large toilet room, which is quite complicated, several vent stacks are employed, and this is a wise plan. In several of these long lines of fixtures, which are served by circuit or loop vents, it would be well to use an auxiliary or relief vent about in the center of the line, to make the venting more positive.

From Allentown, Pa.

Figs. 5, 6, 7, 8 and 9.—In this solution of the drawing problem, instead of making a single elevation of the entire plumbing system, four separate elevations have been made of different parts of the work. Personally, we think this is often the better method. When one elevation

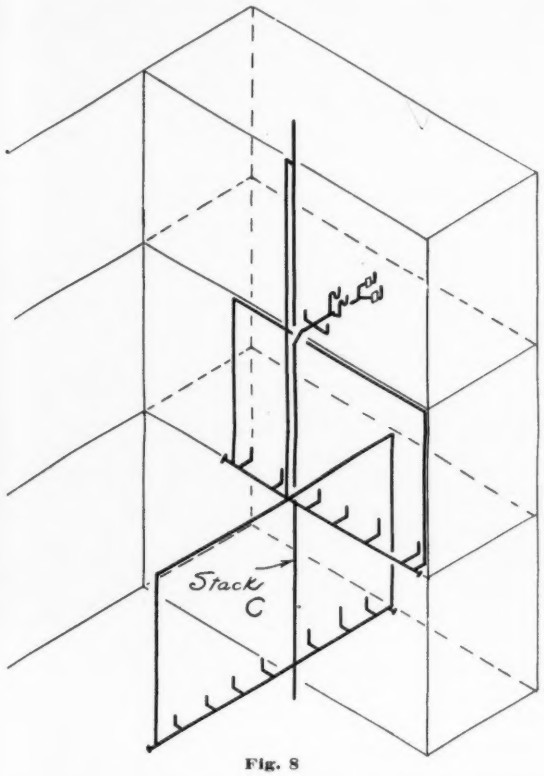


Fig. 8

covers the work, especially on work so complicated as this, connections for one group of fixtures become confused with some other group, and unless care is taken to trace the piping through a clear understanding will not be gained.

These elevations are accompanied by a plan, and that is the only correct way. Fig. 5 shows the floor plan of the first floor, with the stack locations indicated by letters. Fig. 6 shows stack A, into which the three barber shop lavatories and the soda fountain sink discharge. The two top floor lavatories and the fountain sink are unvented. The former are alluded to as being stack-vented, but fixtures are only stack-vented when they have a continuous vent. It would probably be best to use a unit vent on these lavatories. It is O. K. to give the fountain sink an indirect connection or to treat it just as other ordinary fixtures are handled. In this instance it has a regular connection. This would be all right if a P trap and continuous vent were used.

Fig. 7 shows stack B very clearly. About the only suggestion we have to make is that on the third floor, where one circuit vent serves four water closets and four urinals, it would be well to use an auxiliary vent midway of the line of fixtures. This would help the venting.

Stack C is shown in Fig. 8. The lavatories and bathtubs on the top floor should have unit vents.

Fig. 9 shows stacks D and E, and into the latter stack one of the long lines of water closets on the first floor, the one in the men's toilet room, is discharged. The line in the ladies' toilet room discharges into stack C, Fig. 8. If these two lines discharged into one pipe, there would be a saving made. An auxiliary vent on the urinal line and on the water closet line would be advisable, as the lines are long.

As a matter of fact, we think these separate elevations are preferable, as far as clearness is concerned, to the

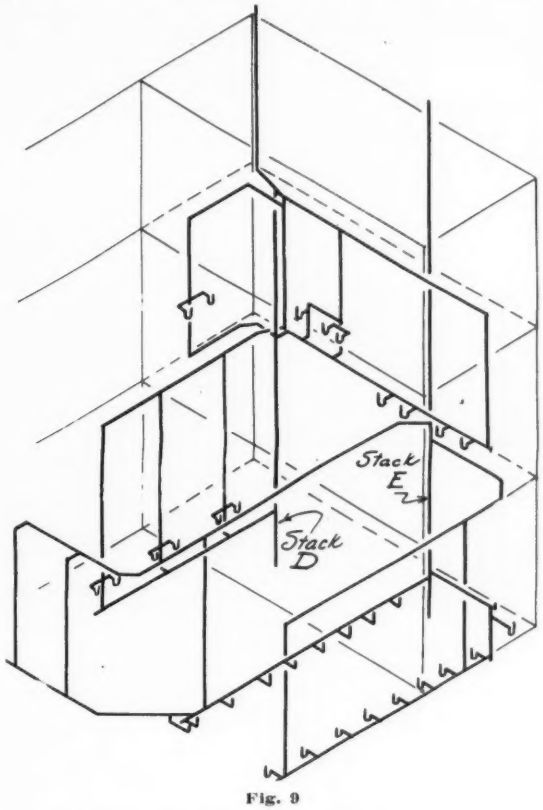


Fig. 9

complete elevation. We say this of this particular plumbing system, for in some other case our opinion might be just the opposite.

To members of the Schoolmaster's Class: You may expect some plumbing problems of superior merit in the winter, spring and summer 1928 editions of "Domestic Engineering." Do not fail to study them. It is hoped that each member of the class will also send in a solution whenever he has an opportunity.

A QUESTION OF WATER PRESSURE

IN a letter accompanying these drawings the following question is asked, "It takes 27.672 inches of water to make one pound of pressure. Now, take a 4-inch pipe and a ¾-inch pipe and put this height of water in each and put a gauge at the bottom of each. There will be one pound of pressure shown on each gauge. Why is this so? Why wouldn't the pipe having the greater volume of water show the greater pressure?"

Even though the question does not concern our regular plumbing problem, this is certainly the proper place to ask just such questions, and we are always glad to answer them.

When a statement is made concerning pressure, as in

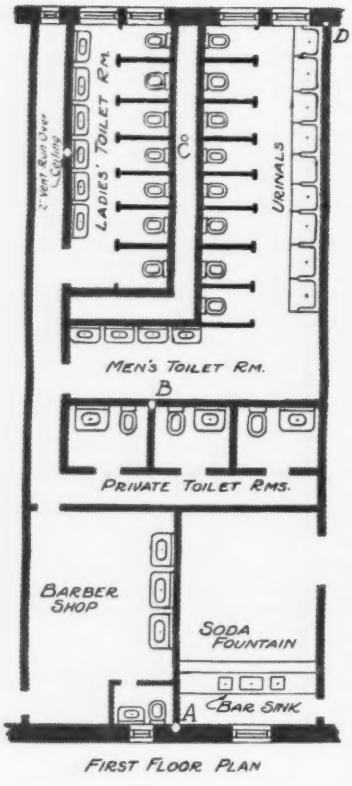


Fig. 10

the case of the pressure of water in pipes, it is always based on the pressure per square inch. When a column of water having a sectional area of one square inch is 27.672 inches in height, the pressure on that area is one pound. Putting this in other words, under the above conditions there will be a weight of one pound on each square inch.

We think we can clear the confusion concerning this matter by taking a very simple illustration. Suppose that water to the depth of 27.672 inches stood on a flat surface covering an area of 25 ft. x 30 ft. Figured in inches this area would be 108,000 square inches. The pressure due to this water would be one pound per square inch, which does not sound formidable at all. But the total pressure on the roof, or, in other words, the total weight of water on the roof would amount to one pound for each square inch of area, or 108,000 lb., or 54 tons. We trust that this will set the matter clear.

It has occurred to us that a table of water pressures might be valuable to many readers, and we are therefore showing such a table in connection with this article. The table shows the pres- of water per square inch for heights or heads from 1 ft. to 1,000 ft.

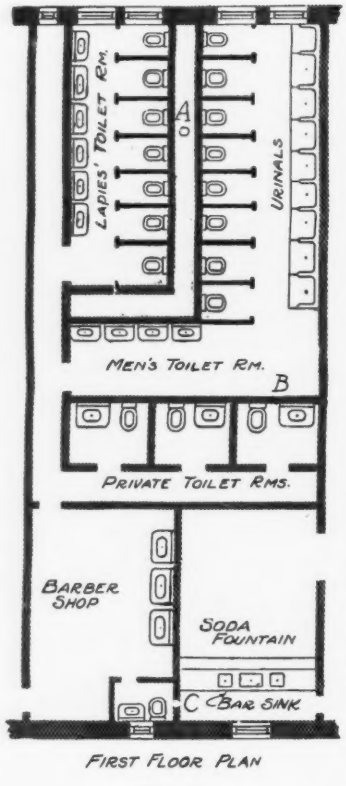


Fig. 12

From New Haven, Conn.

Figs. 10 and 11.—This elevation is perhaps as clear as any that have been submitted. It is based on the floor plan shown in Fig. 1. There is one thing we note on this isometric that might be improved—the traps and their outlets do not in all cases seem to point in the true direction. For instance, the traps of the three barber shop lavatories on the first floor seem to point lengthwise of the building, rather than at right angles to that direction. A little study of this point will show how to rectify it, so that in each case the trap will point out from its vent connection in a correct manner.

The urinals seem to be crown-vented, although in all probability this may not be intended.

We note that the double line of water closets is circuit-vented, whereas other lines have the common vent. It would seem to us that on such work as this, where there are long lines of fixtures, circuit or loop venting is generally the thing to use. This would apply also to the urinals. The general plan of this layout is very good. That special interest is taken in the work is shown by the fact that blue prints were made of the floor plans.

(Continued on Page 69)

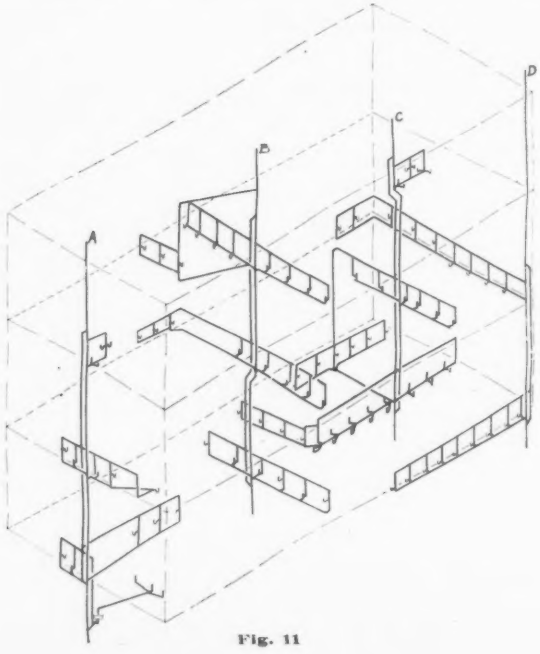


Fig. 11

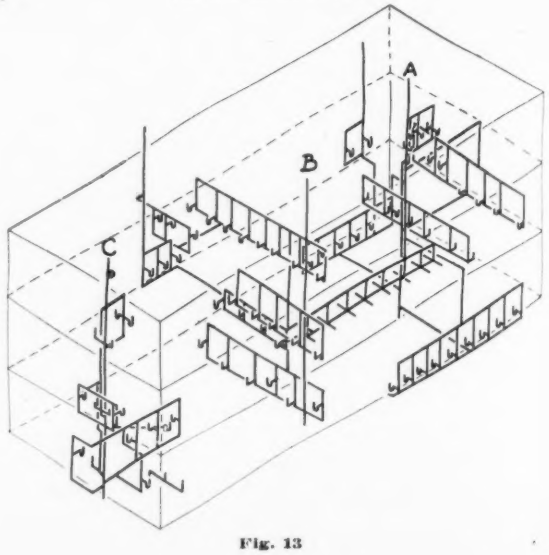
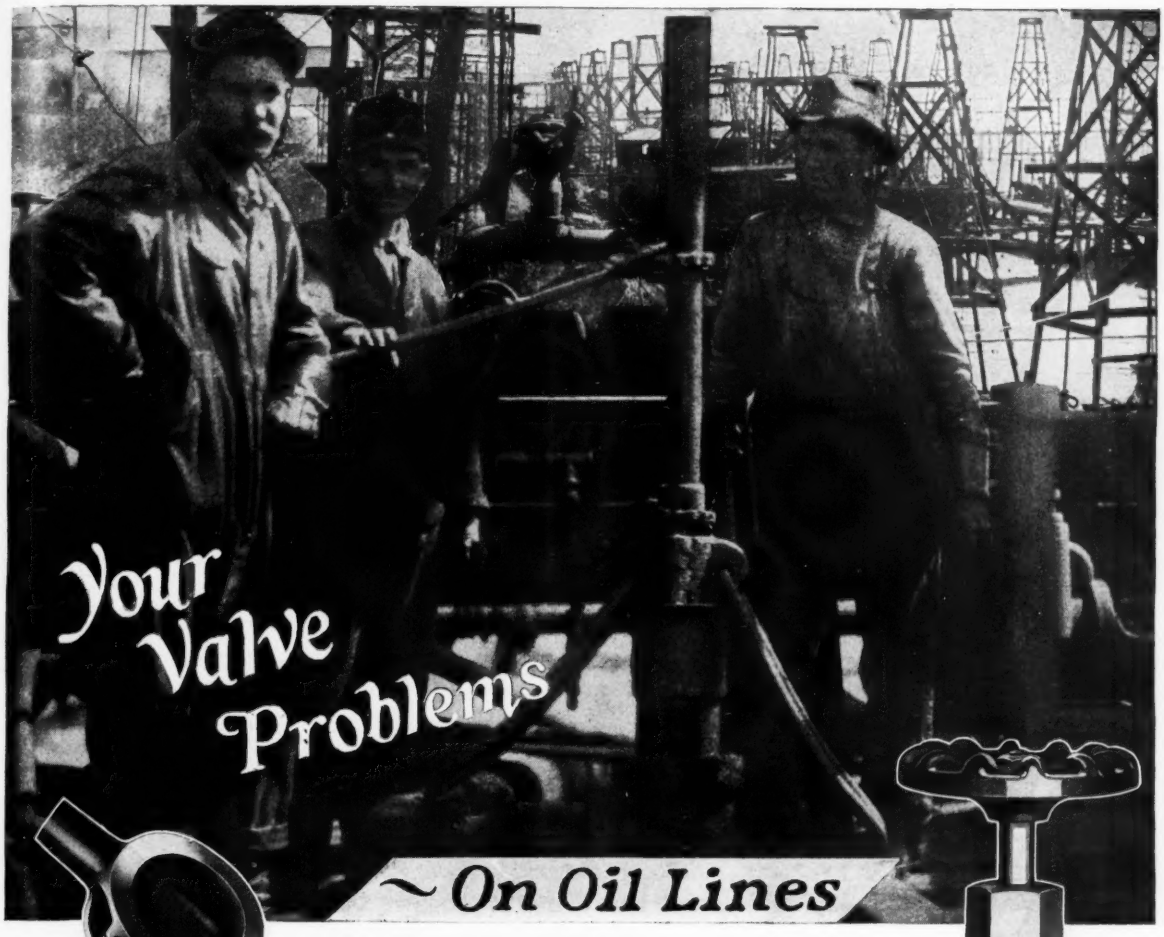


Fig. 13



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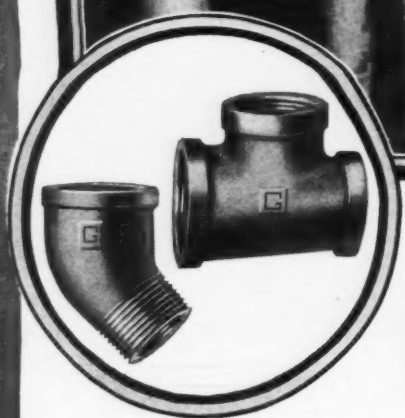
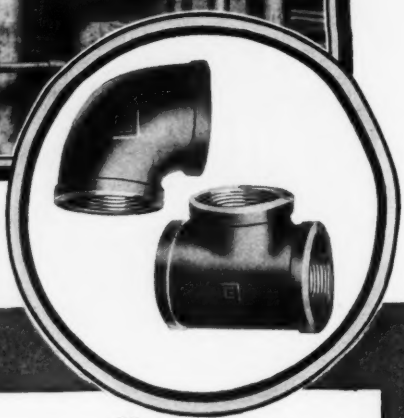


A few of the typical Square "Gee" fittings used on the above installation.



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The new line of Square "Gee" brass fittings combines all the well-known qualities that built the reputation of the famous Square "Gee" Malleable Pipe Fittings.

This is one of a series of picture stories on the Manufacture, Use and Handling of

No. 43

FAUCETS

WORLD WIDE USE

HERE ends the series of 43 Picture Stories on the manufacture, use and handling of faucets. These stories have appeared in 43 issues of "Domestic Engineering."

Doubtless devices that functioned as faucets were used 5,000 years ago, but not until about 50 years ago did the fore-runner of the modern faucet make its appearance. The results of the enterprise and ingenuity of American faucet makers are used in every country under the sun. Even in remote and inaccessible parts of Russia news has been received of the labor saving and life saving qualities of the modern faucet. The picture above shows a family in central Russia which is about to be released from the water yoke. As soon as the Russian plumber, shown at the extreme right of the picture above, installs the pipes, fittings and faucets shown in the foreground, the women of the family will be relieved of the back-breaking toil of carrying water.

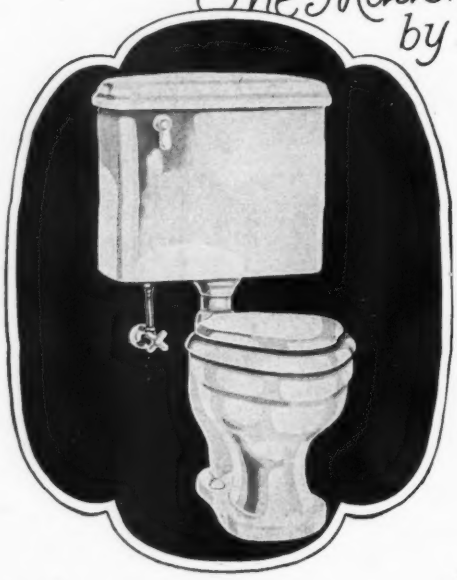
There are substantial exports of faucets, pipes, sanitary ware, as well as boilers and radiators to this country. These exports amounted to something like $39,000,000 in 1926. There are also many other countries to which American plumbing and heating goods are being shipped in large quantities.

In many foreign countries where bathing and water at the turn of the faucet are becoming more widely known and desired by a greater number of people, faucets of American manufacture are a continual advertisement for American manufacturing methods.

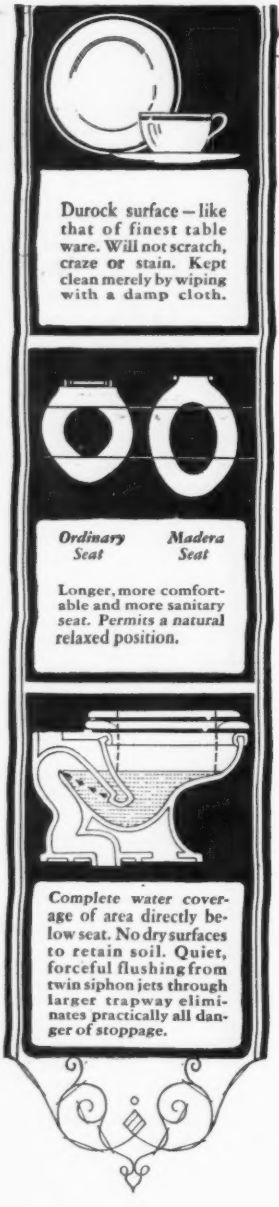
In Manchuria, said to be the most rapidly growing country in the world, American faucets are used on such large installations as hospitals, hotels, etc.

But American faucet manufacturers are not satisfied with having made American faucets known throughout the world. There are new and beautiful finishes that resist discoloration, new finishes so hard they can scarcely be scratched with a file, new and beautiful designs, new contrivances that make them still more convenient and useful, and mechanical improvements that tend to make them easy to repair. And the end is not yet. A number of patents are allowed each year to inventors who hope to add some further improvement to faucets.

The Madera by Maddock



These Features Mean Madera Superiority



Durock surface—like that of finest table ware. Will not scratch, craze or stain. Kept clean merely by wiping with a damp cloth.

Ordinary Seat *Madera Seat*

Longer, more comfortable and more sanitary seat. Permits a natural relaxed position.

Complete water coverage of area directly below seat. No dry surfaces to retain soil. Quiet, forceful flushing from twin siphon jets through larger trapway eliminates practically all danger of stoppage.

Triple your profits on water closet sales

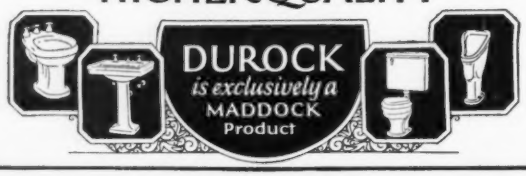
Put a Madera combination in your store and show it to your customers.

Show them its long, comfortable seat, impossible to soil; its elongated bowl and large water area. Tell them about its extra large trapway and the positive flushing action of its twin siphon jets. See illustrations at left. Give them these reasons for buying this better closet. They will buy—and you will make three times the ordinary profit.

THOMAS MADDOCK'S SONS COMPANY
DUROCK *Bathroom Equipment*
TRENTON, N.J.

MADDOCK

Since 1859—No Name has stood for HIGHER QUALITY



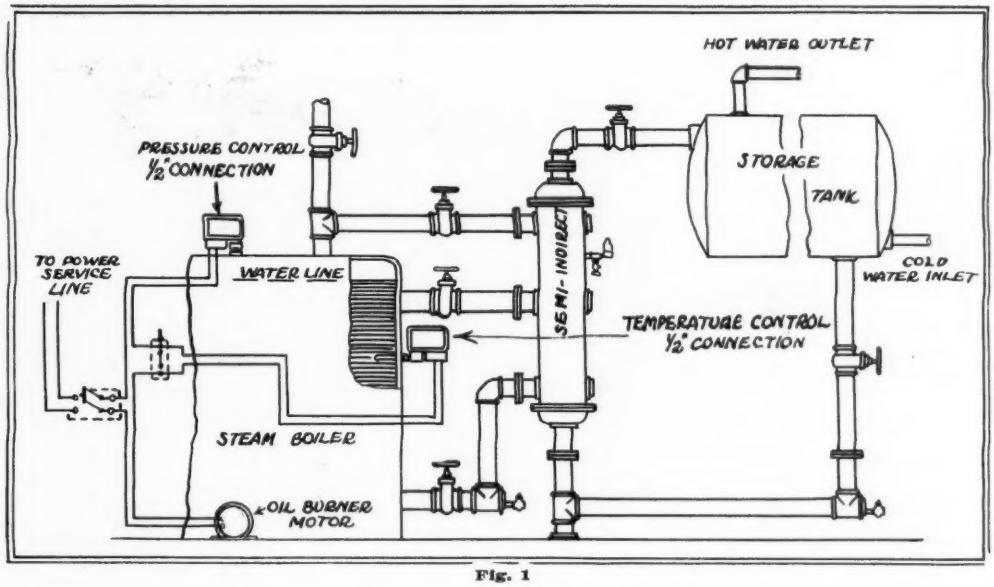


Fig. 1

Using an Oil Burning Steam Boiler in a Summer and Winter Combination

A SUMMER and winter combination using an oil burning steam boiler, oil burner and suitable controls, shown in the accompanying illustrations is recommended by a manufacturer of water heaters. This installation does not require closing off of the valve in the steam supply to the radiators, since no pressure is generated in the boiler. See Fig. 1.

A temperature control is installed below the water line in the steam boiler and is set to break the circuit to the oil burner motor at approximately 160 to 170 degrees.

A pressure control is installed on the boiler. It should be set during the summer months at its lowest point—to break the circuit at the lowest pressure. Both controls are connected in series with the oil burner motor, either one of which can stop the burner independently of the other.

The operation is as follows: As the temperature of the water in the boiler falls the burner is started, heating the water which circulates through the heater and heats the water to the storage tank. As the temperature of the water in the boiler advances above 160 to 170 degrees, the oil burner is stopped. In this installation the semi-indirect heater is operating from water temperature only as no steam will be generated. The pressure control must be installed as a safety feature to prevent steam pressure advancing and filling the radiators.

A single pole knife switch should be installed on the temperature control circuit which must be closed during the winter months, since at that time, in order to carry steam pressure, the boiler temperature must naturally advance above the limits used in the summer months. During the winter no control need be required on the heater.

It is to be noted that in both of these installations the pressure control becomes part of the standard equipment of the oil burner as all oil burners should have a pressure control on the boiler for use during the winter months when the boiler is used for heating the building.

These two installations, therefore, require only one extra control over those normally used.

A summer and winter combination using oil burning steam boiler controls and heater, with hot water supply controlled from tank is shown in Fig. 2. A temperature control is inserted in the storage tank as illustrated. This instrument has an adjustability of from 110 to 220 degrees and can be set for any desired water temperature within those limits.

The pressure control is installed on the steam boiler. The instrument shown has adjustability of from one to fifteen pounds and can be set to break circuit and stop the oil burner at any pressure within those limits. Both controls are wired in series with the oil burner motor so that as either the temperature of the water or the steam pressure advances to the desired amount, the circuit will be broken and the oil burner stopped. This installation requires that the valve in the

(Continued on Page 72)

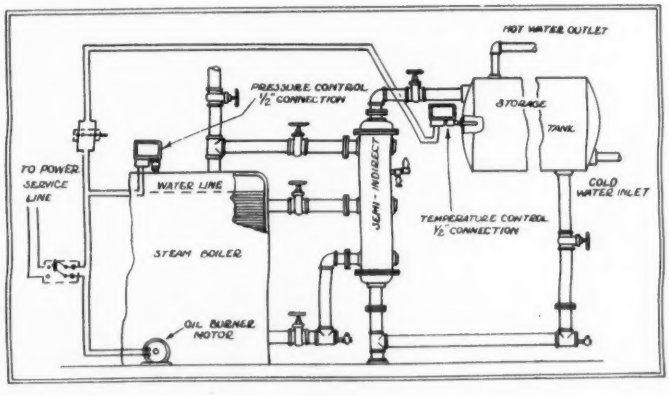


Fig. 2

No. 1210
With Brass
Spout

No. 1211
With China
Spout

No. 1212
For Integral
Spout Lavatory

No. 1010
As Shown

No. 1015
With Shower
Valves

No. 1000
With Shower

These Fixtures Are Furnished Assembled
YOU SAVE TIME

When you use "American" bath and lavatory fixtures, you have two things assured you.

The first is complete customer satisfaction because of "American's" high quality and reasonable price.

The second is your own satisfaction and permanent profit because "American" fixtures are furnished to you assembled.

This means the minimum of time for installation. No lost time looking for lost screws or other small parts. "American" Fixtures arrive on the job ready for immediate installation and service.

There is nothing to go wrong either at installation or after it—thus your profits are fully protected. Order "American" Fixtures from your jobber.

Write us for catalog of new additions to the "American" line.

AMERICAN SANITARY MFG. CO., ABINGDON, ILL.

American

Advertising Editorial

A NEW ONE EVERY WEEK—No. 300

1928

—will the home be up to date?

WILL it be serving your family with the same efficiency as it did when you first moved into it—or will it be a source of annoyances and petty irritation because its equipment is insufficient to care for the family? Give the family a chance to start its day in peace and comfort by bringing plumbing equipment up to date—so that each may have his morning bath, his shave, his shower, without some one else thundering on the bathroom door. Let us consult with you about extra plumbing equipment. Just te'ephone.

(In this space your Name,
Telephone, and
Address)

Christmas Money—It's Still Good

THERE'S a lot of buying done after Christmas. Gifts of money have been made; there will be some of the Christmas savings money held aside for needed purchases for the house. Now is the time to interest home owners in your communities in remodeling plumbing and heating equipment and bringing it up to date. Go after this type of business through your local newspaper, using the Advertising Editorial illustration and copy each week. Only $4.20 for twelve weeks' service. Send your order today. We send you cut and reprint of this page each week—all you do is hand them to your paper. That makes your advertising job an easy one.

SALES LETTER

One a Week—No. 137

Get your mailing list working on after-Christmas prospects, too. Send the following letter to a selected list. Your office girl can get it out in her spare time.

J O H N B R O W N
Plumbing : Heating

Two Rivers, N. Y.,
December 24, 1927.

Mrs. Edward Jones,
Two Rivers, N. Y.

Dear Madam:

When all the flurry of the holiday season is over, and the family has settled down again to routine living, will the old house be serving as efficiently as it might? You know how small annoyances in the rush of the morning can upset the day.

Yet it's understandable that members of the family who must be at the office or at school are impatient of waiting. It's annoying to be on either side of the bathroom door when more than one wants a morning bath, a chance to shave, a shower. All the good effects of the morning bath will be lost if there's someone thundering on the door.

The solution is an extra bath room. The result: contentment on the part of every member of the family, greater convenience for you, and a reasonable chance that the family will go to its several tasks in 1928 cheerfully.

These things are important; they bear a very close relationship to successful lives. Happy home surroundings, an absence of bickering—these help in the every-day work and form the basis of happy memories of home life.

Very truly yours,
JOHN BROWN.

Adlet

ONE A WEEK—No. 158

WE ARE approaching the turn of another year. If you haven't advertised up to now, make that No. 1 in your good resolutions for 1928. If you want your business to grow, you have to advertise it. It's the only way to get new customers—and you know from experience that old customers aren't always loyal. They go where convenience or promised advantages lead them. Start now with the Adlet, if you can't afford the Advertising Editorial.

An Extra Bath

Will make for a happy family—no more squabbling about who's first to the morning bath. A small space and a small investment will be sufficient. See us.

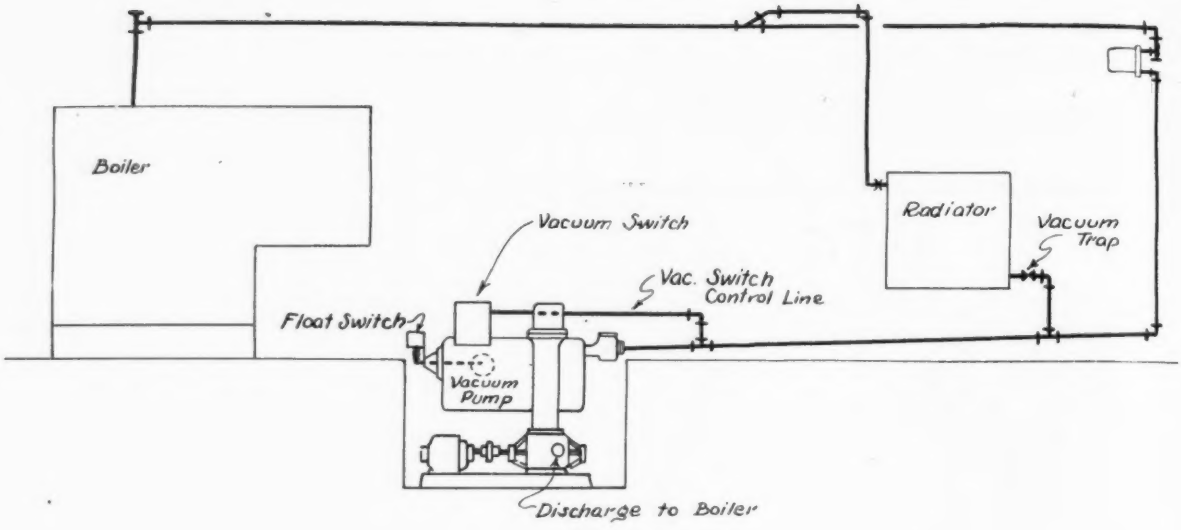


Fig. 1

The Equalizing Pipe

By JAMES J. HAYES

The article in the November 19, 1927, issue of "Domestic Engineering" by our old friend, John F. Hale, entitled "Why Heating Devices Do Not Work," certainly was right to the point.

It is remarkable the large number of heating installations that may be found which are giving trouble, not only to the owner of the plant but to the contractor as well, in which the trouble is due to faulty installation of equipment.

This time of the year, when many vacuum heating systems are being fired up, numerous situations develop which are puzzling to the contractor and operator of the plant. Possibly one of the most common difficulties encountered with this type of system is due to the fact that too high a vacuum is carried on the boiler. This vacuum is produced by not firing the boiler hard enough to completely fill the job with steam. This article entitled, "The Equalizing Pipe," explains the cause and the method of correcting such a condition.—James J. Hayes.

NO DOUBT every steamfitting contractor has installed at least one vacuum heating system in which too much vacuum prevented the return of the condensation to the boiler. This trouble is usually experienced with systems in which an automatic electric vacuum and low pressure boiler feed pump is used to produce a vacuum and to return the condensation to the boiler, and is especially prevalent in one-story buildings. In this type of building, the return line is often long and with little pitch, due to the necessity of placing wall radiation under the windows.

Fig. 1 illustrates diagrammatically a low pressure system of this type. Steam leaves the boiler through an overhead main and is fed downward to the radiation. The condensation, vapor and air, passes through the thermostatic vacuum trap to the return line, and from there to the vacuum and boiler feed pump.

It is general practice to design these vacuum pumps with two controllers. One of them consists of a float in the receiving tank of the pump, which actuates the motor starter and cuts the pump in or out of service as the condensation rises and falls in the receiver. The other control is a diaphragm vacuum regulator connected to the return line, which starts the pump at about four inches of vacuum and cuts it out of service when the vacuum rises to eight or ten inches.

Under normal cold weather conditions steam is generated at about two pounds boiler pressure and is admitted to the steam main without the use of a pressure reducing valve. If the amount of radiation is sufficient for the job and the boiler is the correct size, perfect circulation will result with not to exceed six to ten inches of vacuum at the pump. Under these conditions the vacuum regulator stops the pump, remaining out of operation until the vacuum falls to the cut-in point or until condensation rises sufficiently high in the pump receiver to cause the float switch to function.

Just such plants as this are installed in churches, schools, and industrial buildings. In many such buildings the attendant is not always present to watch the boiler pressure. This is almost always the case when an oil burner is used.

Suppose the intensity of the fire or burner flame is allowed to decrease to the point where the boiler will not supply sufficient steam to fill the mains and radiation. Immediately a condensation vacuum

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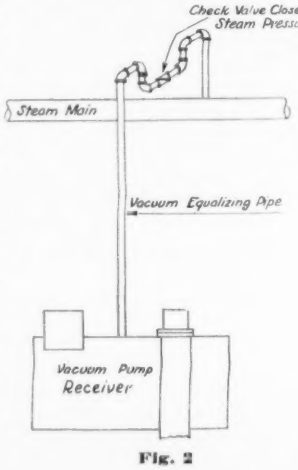


Fig. 2

The Need for BARBER BURNERS Has Been Established—You Have Only to Take the Orders

Your customers have all been educated to the conveniences and efficiency of gas heat—they are but waiting to be told of the Barber Patented Jet Gas Burner which puts gas heat within the reach of all.

The Barber Burner makes automatic gas heat possible to any heating system without the usual expensive purchase of a new boiler. With the Barber Patented Jet Gas Burner, all of the ashes, dirt and uncertainty of the older methods of heating are eliminated.

The Barber Burner is fully guaranteed—simply take the orders, telling us the name, type and number of the boiler in which the burners are to be used and we send you the correct burner for the installation.

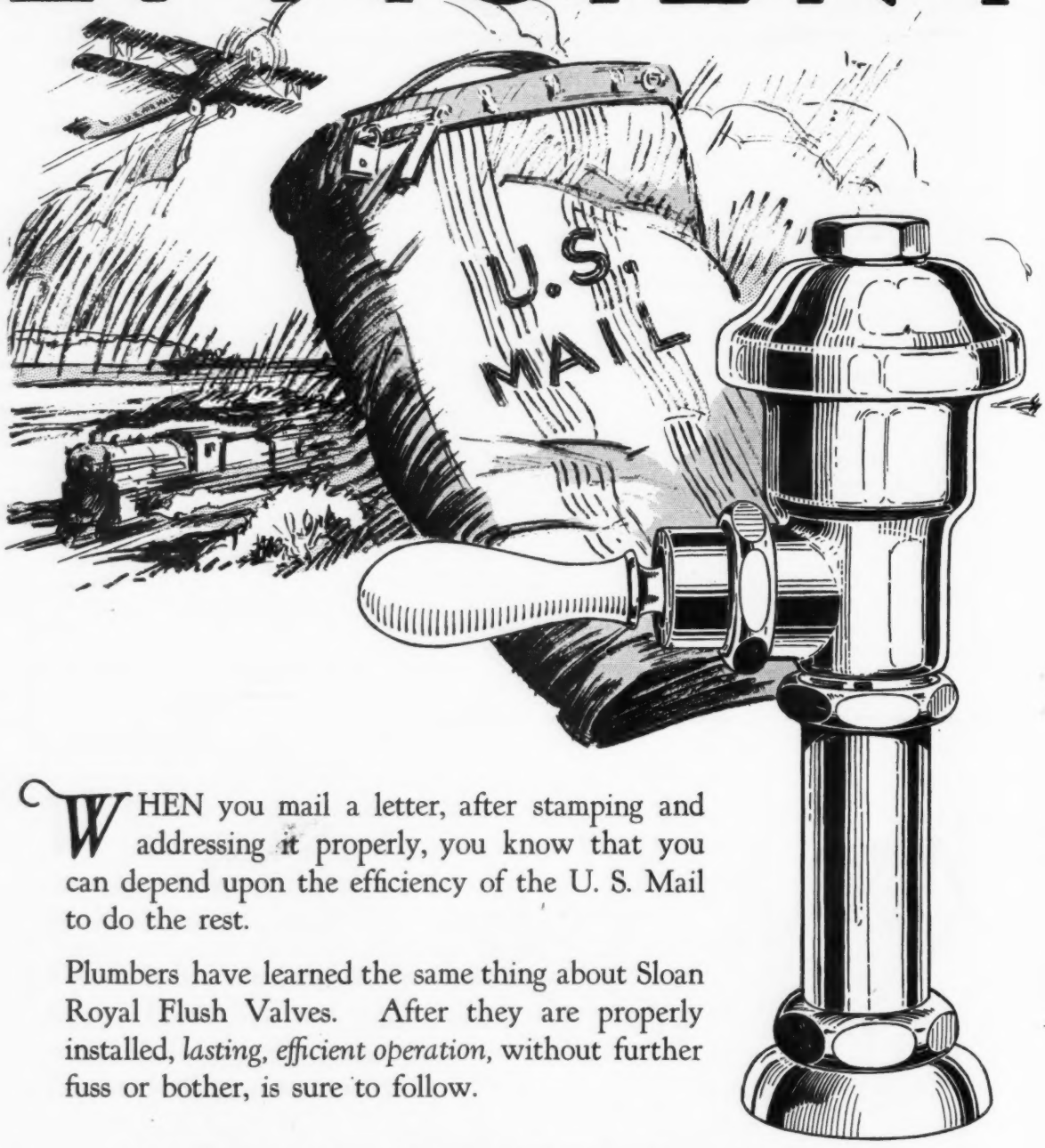
Write us at once for further information on the Barber Patented Jet Gas Burner agency for your territory.

The CLEVELAND GAS BURNER & APPLIANCE CO.

Burner Specialists

3702-04 Superior Avenue, Cleveland, Ohio

EFFICIENT



WHEN you mail a letter, after stamping and addressing it properly, you know that you can depend upon the efficiency of the U. S. Mail to do the rest.

Plumbers have learned the same thing about Sloan Royal Flush Valves. After they are properly installed, *lasting, efficient operation,* without further fuss or bother, is sure to follow.

ROYAL FLUSH VALVES

SLOAN VALVE COMPANY
CHICAGO

Albany, N. Y.	Buffalo, N. Y.	Denver, Colo.	Kansas City, Mo.	Indianapolis, Ind.	Oklahoma City, Okla.	Seattle, Wash.
Atlanta, Ga.	Butte, Mont.	Des Moines, Iowa	Los Angeles, Cal.	Minneapolis, Minn.	Philadelphia, Pa.	St. Louis, Mo.
Baltimore, Md.	Cincinnati, Ohio	Detroit, Mich.	Memphis, Tenn.	Nashville, Tenn.	Pittsburgh, Pa.	Syracuse, N. Y.
Birmingham, Ala.	Cleveland, Ohio	Durham, Conn.	Miami, Fla.	Newark, N. J.	Richmond, Va.	Tampa, Fla.
Boston, Mass.	Dallas, Tex.	Fort Wayne, Ind.	Milwaukee, Wis.	New Orleans, La.	San Francisco, Cal.	Washington, D. C.
		Grand Rapids, Mich.		New York City, N. Y.		

MARKETS

BUSINESS CONDITIONS IN LEADING JOBBING CENTERS

Enameled Ware Prices Are Reduced

THE outstanding development of the week was the announcement by one large enameled ware manufacturer of a price reduction of approximately 15 per cent, effective December 15. Price sheets incorporating a similar reduction have been issued by a number of other large makers of enameled ware. Another important change in the price situation at the time of going to press was the withdrawal of published quotations by several large cast brass manufacturers. As yet, these interests have not issued new sheets. Steel pipe, wrought iron pipe and range boiler price sheets are being adhered to closely. Soil pipe prices are reported improved in several sections. Quotations on pottery are, in general, quite firm, but the same cannot be said of boiler and radiator prices. Jobbers' shipments maintained close to the same level as during the week before. Buying has dropped to a low level, most jobbers diverting the greater part of their time to preparing their stocks for inventory and straightening out old accounts on their books. However, master plumbers' and heating contractors' current requirements are of fairly good size, and quite frequently jobbers find it necessary to order small quantities of material in order to safeguard their delivery facilities. Prompt deliveries prevail at manufacturing sources of supply.

New orders for 1,221 steel boilers were placed in November, as reported to the Department of Commerce by 72 manufacturers, comprising most of the leading firms in the industry, as compared with 1,270 boilers in October and 1,312 in September. November wholesale prices of standard plumbing fixtures for a six room house, as collected by the Department of Commerce from reports of twelve representative manufacturers and wholesalers, were $104.33, as compared with $104.71 in October and $106.02 in November, 1926. As indicated by check payments, the dollar volume of business during the week ended December 10 was greater than during the previous week or the same week of 1926.

MIDDLE ATLANTIC

Inventory Occupies Atttntion af Jobbers—

It is very close to stock taking time, and a large proportion of the wholesalers from Southern New Jersey to Florida are either starting to take inventory, are preparing to take it, or are thinking about the task soon to come. For this reason, the average manufacturers' salesman is met with more or less of a cold shoulder when he calls upon the wholesalers' buyers, whose chief interest at present is to count what they have rather than to add to the stocks on hand. Of course there is a rather wide divergence of opinions among the distributors about the proper time to take inventory, and some of them will not really begin until late in January or early in February, and these companies are more concerned about keeping up their stocks.

Forward buying continues to be the exception, rather than the rule, as it has been practically all during 1927. This tendency, it is said by some manufacturers, is more marked than ever at the present time, but other salesmen find that the average jobber has so reduced his stocks that it will be necessary for him to get in a considerable volume of goods immediately after the first of the year. Wholesalers in this position are showing some interest in commitments to cover the month of January, and are even providing for first quarter needs for some products. This is particularly true of cast brass goods, there being quite an active demand for first quarter requirements. Tubular products, too, are picking up, with many quotations asked. Considerable enameled ware is now being ordered for shipment during January, the better grade ware predominating in these orders. Other lines covered by this report tell of no forward buying of consequence.

Those wholesalers who are looking into the future with prophetic eyes are rather sharply divided in their predictions, their location in the territory determining their degree of optimism to some extent. For instance, in the South many jobbers seem to think there will be a fair amount of the smaller type of buildings erected, with a very small number of big projects. In Washington, contractors and distributors are looking for an increase in public building erection, this being contingent on Congressional action. Baltimore will see considerable building of office buildings, hotels and the like, with a probable slowness in house erection. Philadelphia, in the opinion of some authorities, is close to the over-built margin in big buildings and the majority of operations there are likely to be for smaller type apartments and dwellings. School programs are being slashed at the latter point, with only about 50 per cent as much expected in 1928 as during the past few years.

Enameled ware prices were reduced about 15 per cent during the week, and several cast brass manufacturers withdrew prices. Wholesale figures have changed little during the last 60 to 90 days, the narrow margins that were current earlier in the year being maintained despite

the lessening of sales as the year approached its zenith. Credit conditions have changed but little, sellers finding it necessary to use caution in their dealings.

Soil Pipe

There is a lack of unanimity in reports from manufacturers about price conditions, although there seems to be a slightly firmer tone. Some of the producers now say that foundries are unanimous in quoting only at published prices, while others say that "insides" are occasionally given. Demand is seasonal, which means there is not a great deal of pipe moving into the market. One Eastern foundry states it is getting requests for shipment after January 1. Wholesale stocks are not being built up. Prompt shipments are possible.

Steel Pipe

There is little change in demand since that current earlier in December, some mills state. Lack of need for steel pipe at this season of this year holds the number of requests down to a minimum level, and there is practically no call for pipe for delivery after the first of the year. This is contributed to somewhat by the fact that mills can ship any ordinary order with practically no delay. Mill prices continue steadily firm and wholesale figures have not been changed.

Wrought Iron Pipe

Demand continues at a low ebb, which is natural at this season of the year. December will show a smaller tonnage shipped into the territory than the mills received during the same period in 1926, unless business shows a considerable pickup during the next few days. There has been no change in prices, mill figures being the same as they have been for several years, and wholesalers quoting on the basis established about the middle of the year. There are no delays in shipments of standard sizes and lengths.

Enameled Ware

Quite a few of the wholesalers have placed comparatively small orders for enameled ware for delivery during January, as the average distributor has only enough ware on hand to take care of current needs, and this will no doubt be dissipated by the time inventories are completed. Orders for shipment at once are getting scarcer as the season advances. Prices were reduced about 15 per cent during the week. Deliveries can be made without delay.

Pottery

Current business is naturally slow, the reduced demand from master plumbers being reflected in the call upon manufacturers by wholesalers. The latter, having stocks in most instances that will carry them for the next few weeks, are not particularly interested in placing orders for immediate use, and few are anticipating needs. Prices generally have not changed. There are few delays in shipments of staple goods.

Plumbers' Brass Goods

Buyers are showing a keen interest in quotations on cast brass, and several manufacturers report securing a good deal of business for delivery during the first quarter. Tubular manufacturers' salesmen also report that they are doing a good deal of quoting, but as yet few of these quotations have developed into orders. Actual shipments into the territory at this time are not heavy. Several cast goods manufacturers withdrew price sheets during the week.

Range Boilers

Current demand is not particularly heavy, due to both the lack of need for boilers at the season and to the fact that a great many distributors placed considerable business before the price increases that went into effect recently. Shipments are beginning to show a slight increase as makers start shipping the boilers ordered during the first two weeks of the month. Rush deliveries can be made if necessary.

Boilers and Radiators

A good many wholesalers are buying only enough boilers and radiators to take care of the orders they receive from heating contractors. There is still a lack of firmness in price quotations when considerable quantities are involved. Manufacturers' stocks are ample and quick deliveries can be arranged.

CENTRAL WEST

Shipments Show Little Change—

Seasonal influences predominated the plumbing and heating business in this section during the past week. Inside of ten days the majority of wholesalers will be engaged in counting their stocks, and, in view of this, are not ordering fresh material except where low spots in their holdings make necessary additional material in order not to jeopardize their delivery facilities. Naturally, as contractors are working right along on their various contracts, material continues to move out of jobbers' stocks in about the same volume as during the previous weeks of the month. While there is little change in the requirements of the trade for the various commodities and the demand on the jobber is on about the same plane as it has been since the first of the month, this statement is not applicable in the same sense to the manufacturer. The reason advanced for this is that at the first of the month jobbers were in possession of fairly good-sized stocks, which, with only slight exceptions, were sufficiently large to see them through the remainder of the year without reordering from the manufacturer on as large a scale as material was moved into consumption. Reports of future buying are very scattered. Instances are cited of jobbers having anticipated their brass requirements for the early part of 1928, but these are not numerous. Jobbers are also well taken care of on range boilers for a like period, due to the recent price advances.

The demand on soil pipe foundries, according to makers, is very light and jobbers appear to be in a position to supply their trade with this pipe from stocks on hand. Steel pipe and wrought iron pipe demand has quickened slightly compared with demand during November. Enameled ware, pottery and plumbers' brass goods are moving at a fair seasonal pace. Manufacturers of range boilers are in the wake of recent price advances and are busy shipping against orders placed at the low price level. Heating equipment continues to move in good seasonal volume, the recent cold weather having added zest to the repair end of the business.

Almost without exception, manufacturers are able to grant immediate deliveries, and the same service is available at jobbing sources of supply. As far as can be learned, all range boiler manufacturers are now doing business at the sheet first established on December 10. Enameled ware prices were reduced about 15 per cent during the week and several cast brass manufacturers withdrew their price sheets.

Soil Pipe

Requirements of master plumbers for soil pipe have been slowly dropping off for some weeks as the number of projects at the roughing-in stage grew less, and, at present, needs of the trade are light. This condition is reflected at foundries, where the lack of activity is quite pronounced. Although production is not going forward on a full time basis, makers are in a position to promise prompt deliveries. Practically all wholesalers are well

enough stocked with soil pipe to take care of the current needs of their customers without ordering additional pipe. The price situation remains unchanged.

Steel Pipe

While shipments of steel pipe dropped off during November, business appears to have picked up a trifle during December. However, the tonnage placed so far this month is said to be below that for the corresponding period of last year. Heating contractors' requirements have expanded slightly of late, due possibly to the increased activity brought about in this branch of the business by the recent cold weather. While most distributors have sufficiently large stocks to last them until the end of the year, occasional orders for small quantities continue to reach mills. Deliveries are not being delayed at mills, and prices are firm and unchanged.

Wrought Iron Pipe

Mill representatives in this territory state that the month of November was not a very good one from the standpoint of tonnage moved into the Chicago district. The first half of December, however, has brought about an improvement to business. Nevertheless, tonnages to date for the month are not as heavy as for the same two weeks of December, 1926. New business reaching mills is mainly for small quantities of pipe and prompt shipment requests are usually a part of these orders. Mill stocks are ample and well assorted and no delays are encountered in shipments. Prices are firm at the level established early in 1923.

Enameled Ware

The outstanding development in the enameled ware market during the week was the announcement by one large manufacturer of a 15 per cent price reduction, effective December 15. This move was followed by several other large makers. This is the first price change in enameled ware since early in 1923. The change, however, occurred too late in the week to make itself felt in the seven days covered by this report. Wholesalers purchased only such material during the week as their immediate needs required, keeping in mind the approaching inventory-taking period. Manufacturers are in possession of ample and well assorted stocks, and prompt deliveries are the general rule.

Pottery

Demands on potters are not heavy and, in general, actual consumption of ware is reported as slightly below that for the same period of last year. Wholesale stocks are now at a level that will make inventory-taking as easy as possible and jobbers are ordering fresh material only in large enough quantities to replace that which is moved into actual consumption. Stocks at potteries are of sufficient size to insure prompt deliveries of staple items. Prices have not changed.

Plumbers' Brass Goods

The outstanding development at the time of going to press was the announcement of several cast brass manufacturers of the withdrawal of their published quotations. At the time this report was written no new sheets had been issued by these interests. Jobbers in general are not buying in larger quantities than indicated by their current requirements, turning their attentions to clearing their shelves for stock counting. While reports of jobbers buying for their early 1928 requirements are not numerous, they appear to be growing. Tubular prices have not changed. Early deliveries are the rule.

Range Boilers

There is little change to be noted in the range boiler situation compared with last week. Demand from the plumbing contractor is seasonally fair. Jobbers in general have ordered enough range boilers to take care of their needs during the early part of 1928, and, naturally, new buying is very light. Makers, however, are busy shipping against orders placed at the recent low price level. Prices appear to be firmly established at the new high level, and no changes were announced during the week. Deliveries may be had promptly when so desired.

Boilers and Radiators

New orders for 1,221 steel boilers were placed in November, as reported to the Department of Commerce by 72 manufacturers comprising most of the leading firms in the industry, as compared with 1,270 boilers in October and 1,312 in September. Demand for cast iron boilers and radiators maintained a very satisfactory seasonal level during the week, according to makers. Requirements of contractors are not as heavy as a few weeks ago, however. Prices are fairly firm at existing sheets. Prompt deliveries are the general rule.

NEW YORK

Relaxation in Shipments Reaches Low Point—

The plumbing and heating trade in the Greater New York area, as seen from the standpoint of the manufacturer, is coming down to the end of the year with buying at the lowest ebb of the past twelve months. Jobbers view the situation from a somewhat different angle as in most all instances their attention is centered on inventorying and the straightening up of old accounts; at the same time the master plumbers and heating contractors required some materials during the week, created by jobs that are being rushed to completion and by replacement work. Wholesalers generally supplied these wants from their stocks, but instances cropped up where shipments from manufacturers were required to inject new life in some of the arteries of distribution. Of these items, boilers and radiators came in for the most activity and in the instance of several manufacturers the tonnage moved compared favorably with that of this time a year ago. Enameled ware and pottery, as nearly as could be learned, ranked next in the quantity moved, while brass goods, steel, soil and wrought iron pipe were next in order of volumes. Range boilers undoubtedly experienced less activity from maker to jobber than any of the major commodities, this being due to the supply in the hands of the latter.

As far as many jobbers in this territory are concerned, stock taking is completed during the third week of the month, so that at this writing the end of this business requisite was close at hand for nearly half of the wholesale houses. There are, of course, other houses whose fiscal years do not end with the close of the calendar year.

Some New York offices of manufacturers find forward buying in brass goods now compares favorably with the rate of the first quarter commitments of last mid-December. Beyond this no great expansion in this method of buying occurred where needs for the first months of 1928 are concerned.

Aside from range boilers, some soft spots are noted in price quotations here and there on other commodities. Several cast brass manufacturers withdrew prices during the week. Enameled ware prices were also reduced by several large makers.

Soil Pipe

The price structure surrounding soil pipe did not recover during the week with the consistency that was indicated in the preceding report for this territory. The interest shown by way of inquiries on the pipe of two

The Complete Line of National Radiator Products

Aero Radiators
Continental Classic Radiators
Continental Column Radiators
Union Art Radiators
Gurney Column Radiators
Gurney Copley Radiators
Niagara Radiators
Radiator Accessories
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Acme Round Boilers
Novus Upright Boilers
Novus Sectional Boilers
National Smokeless Boilers
Hot Water Supply Boilers (*All Types*)
Gurney Round Boilers
Gurney Sectional Boilers
Niagara Round Boilers
Niagara Low Water Line Smokeless Boilers
Niagara Push Nipple Sectional Boilers
Utica-Imperial Super-Smokeless Boilers
Utica-Imperial Sectional Boilers
Utica-Duplex Super-Smokeless Boilers
Utica-Duplex Sectional Boilers
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BALTIMORE, MD.—2622 FRISBY STREET
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Like a keystone, the National Radiator Corporation ties together the six companies which comprise it. Coordinating their efforts. Balancing their production. Increasing their scope. Augmenting their facilities.

A part cannot be greater than the whole—*but the whole can be greater than the sum of its parts.* With the combined salesforces working in unison and lost motion eliminated; with manufacturing facilities pooled; with its warehousing system strategically arranged to give super-service to the heating trade—the new corporation is equipped and ready to render a kind of help and degree of cooperation hitherto unattainable.

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MASS. VER STREET BUFFALO, N. Y.—McKINLEY BUILDING, DELAWARE AVENUE
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ICHMO 032 NORFOLK STREET WASHINGTON, D. C.—2205 FIFTH STREET, N. E.

foundries subsided during this weekly period and because of their aloofness from dipping beyond the usual discounts their bookings were comparatively nil. On the other hand the total tonnage delivered in this market was not of much consequence. Wholesalers did not as a rule buy beyond their immediate requirements, using the probable needs of their trade as a guide in making their agreements. Deliveries continue to be made with dispatch.

Steel Pipe

That plumbing and heating contractors are not in the market for steel pipe in the quantities they were thirty days ago is evidenced in the business placed by wholesalers. Now even more than at any time during the year jobbers are anticipating more closely the immediate future needs of their customers in placing business with mills. This is accountable for the comparatively poor showing mill tonnage made for the week. Stocks at the plants of manufacturers and other shipping factors insure satisfactory service. Prices have not been changed.

Wrought Iron Pipe

Buyers for wholesale houses seem to be pitching their orders to harmonize closely with their sales; therefore, aside from commitments made to fill contract orders from plumbing and heating contractors already placed with them, little wrought iron pipe business was entered from this territory during the week. Totaled, this made for a rather disappointing weekly tonnage but then this is the season when buying on the part of many jobbing houses is at the lowest ebb. Price quotations from manufacturers are indicative of a firm, unchanged tendency. Deliveries are in no wise curtailed.

Enameled Ware

Reports gathered in the week's survey indicate that trading in enameled ware in Metropolitan New York receded somewhat from the plane of activity that has persistently prevailed for the past several weeks. With much of the ware intended for buildings at the fixture setting point accounted for and the stocks in the hands of wholesalers at the barest minimum until after stock taking, it only follows that some lull obtains. Nevertheless the movement from the warehouses of some makers was fairly good for late December. Little or no complaint is heard of delivery extensions. Prices were reduced about 15 per cent during the week.

Pottery

Quietness characterized the pottery business in this territory during the week and there seemed to be a rather unusual lack of even telephone inquiries. Pottery representatives, though, were busy working on unplaced specifications, of which there still remain numbers that involve large quantities. Wholesalers bought only amounts that were absolutely necessary to the retention of their positions to fill orders promptly. Little or no complaint was forthcoming on delivery service from manufacturers' warehouses. Prices were unchanged.

Plumbers' Brass Goods

As far as some manufacturers are concerned the month is not showing as well as December a year ago; however, it is also true that the business entered for first quarter requirements went rather sharply on the upturn during the past ten days or so compared with the marked hesitancy on the part of supply houses shown toward this method of buying. It is not that master plumbers are in the market for any greater quantities of brass goods, rather it seems the steady rise in the price of copper has had an influence on buyers. Both tubular and cast goods seem to have felt this influence. The shelves of jobbers are by no means heavily laden at this time but then no difficulty has yet been encountered in getting shipments from factories. Several cast brass manufacturers withdrew prices during the week.

Range Boilers

An almost negligible amount of new range boiler business reached makers during the past seven days. Wholesalers are well supplied with this commodity purchased at prices below those incorporated in the prevailing sheets. Quotations made by manufacturers are unquestionably firm. Another factor put a new sheet into effect on the 15th of the month, which placed his commodities practically on a level with those of his competitors. This brings the list prices of about all the factors in this market on a par. Makers are in a position to forward shipments promptly.

Boilers and Radiators

The eyes of the heating trade seem to be focused on the after January 1 period when new price sheets are usually issued by manufacturers. It seems generally agreed that the year has given a better account of itself as far as tonnage is concerned in Greater New York than did 1926. This though of course is not conclusive as figures for the two years have not as yet been compared. Both wholesalers and makers have considerable business on their books for delivery as soon as the projects for which the orders are intended are advanced far enough to receive delivery. The trade has found and is continuing to find business very good for this time of year. Prices remain unchanged. Deliveries are made promptly.

NEW ENGLAND

Enameled Ware Prices Are Reduced—

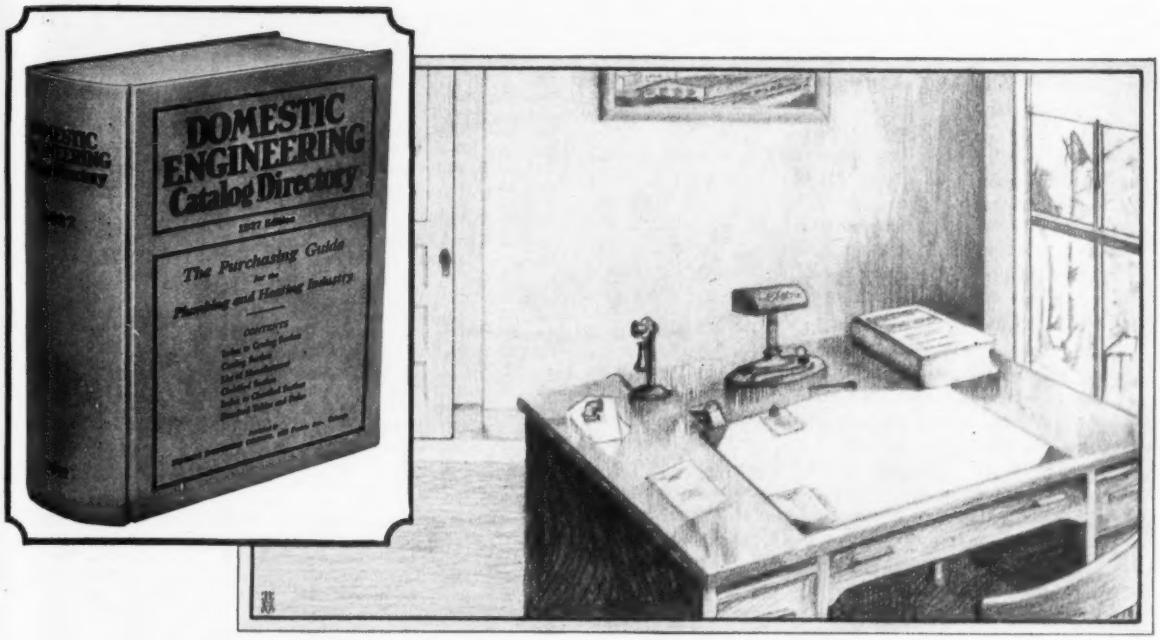
Distribution of plumbing and heating materials in the various New England states, largely abetted by the prevalence of clement weather conditions, continues at a pace which is favorably regarded by most wholesalers. It is only to be expected that contractors' requirements show some shrinkage as the season wanes but nearing the close of this year depreciation has not been so pronounced. Jobbers' volumes have not been as large so far in December as during last month but the real brunt of decline has been taken by manufacturers, for, liquidating processes entertained by wholesalers and their pre-inventory attitude of refraining from buying unless absolutely necessary, have brought about a decided lull of activities at sources.

The November volume of construction contracts let in this territory, amounting to $43,237,800, was the highest November contract total yet recorded for New England. It was also the second largest monthly total on record for this year and is 18 percent ahead of the November, 1926, total, according to F. W. Dodge Corporation. A perusal of the above figures discloses that 38 per cent of the given total was for residential building; 18 per cent for educational projects; 17 per cent for commercial buildings and 13 per cent for public works and utilities.

The long-existing even tenor of enameled ware prices was terminated on the 15th of the month by a prominent maker's announcement of an approximate 15 per cent reduction. Several other makers have followed this reduction. A number of cast brass manufacturers withdrew prices during the week.

Soil Pipe

According to wholesalers, demand for this commodity, as might be expected at this season of the year, is light. Makers' representatives are in receipt of carload business only for after January 1 shipment. The consensus of reports indicates, however, that no large tonnage will be moved into this territory during the opening weeks of



A Worth-while Convenience

Ever since man has inhabited this earth, there has been an evergrowing desire to produce more conveniences. The aim of our forefathers was to develop ways and methods by which their work could be done quicker, simpler and better.

And so on up to the present day we, too, are striving to develop ways and means whereby our work can be simplified and where we can save that invaluable factor—time.

It was to add a worth-while convenience to the plumbing and heating industry that "Domestic Engineering Catalog Directory" was produced. It gives to its users a method of saving time and labor that cannot be fully realized until it has been tried.

The value of "Domestic Engineering Catalog Directory" can be appreciated to some extent, by picturing the amount of filing space required for the catalog material of over 450 manufacturers, and the amount of labor, filing and time necessary to keep this data up-to-date and "get-at-able" when wanted. This Directory performs all these duties accurately, quickly and conveniently.

Standard Catalog
size 7¾"x10⅝"
2000 pages
13,000 illustrations.

Bound in Fabrikoid
(imitation leather)
Price $5.00 a copy,
post-paid.

Between the covers of the 1927 (Fifth) edition are bound the catalogs of 469 manufacturers, making it possible for the user to have all this material at his finger tips.

Within easy reach he has the sources of supply of all items used in the plumbing and heating industry. In addition to the large catalog section, over 2000 items are listed in the classified section together with the trade names and names of the manufacturers.

And so, "Domestic Engineering Catalog Directory" is serving thousands of satisfied users daily. It occupies a prominent place on the desk of practically every wholesaler and other quantity buyer in the country.

This Directory performs the two-fold function of giving manufacturers a direct and economical medium for getting their products before the eyes of buyers and of giving buyers a medium whereby they can locate conveniently the products they are interested in buying.

Complete details on request.

Published by

Domestic Engineering Co.

1900 Prairie Avenue **CHICAGO, ILLINOIS**

the new year. The majority of jobbers have sufficient assortments to carry them through this month and little inclination is being displayed towards their augmentation. Deliveries may be had as wanted. Prices are generally firm and unchanged.

Steel Pipe

Makers' receipts are of considerably less volume than they were a month previous, for together with a sharp decline in contractors' requirements, distributors are ordering in lesser quantities as the first of January approaches. Stocks at both manufacturing and jobbing points are ample for present needs and no interruptions in near-future delivery schedules are evident. Prices are firm and have not changed.

Wrought Iron Pipe

Movements into consumption of wrought iron pipe show gradual decrease as the year approaches its end. The majority of mill orders are for delivery from their local warehouses, in so far as wholesalers are interested only in the fulfillment of their customers' near-at-hand wants. Such forwardings as are being made from sources are usually coming through in quick fashion. Prices are firm and have not been changed.

Enameled Ware

The outstanding development in the enameled ware market during the past week was an approximate 15 per cent reduction in prices effected by one large maker on December 15, and this move was followed by several other manufacturers. Shipments from manufacturers' local warehouses constitute the bulk of new buying being done by jobbers; for the latter, as a rule, are sufficiently equipped to handle their customers' requirements for the balance of the year. Prompt delivery service is being maintained in most all cases.

Pottery

Although some instances of good seasonal movements of special pieces are noted, demand for staple pottery has fallen off considerably during the past several weeks. In view of declining building activities this depression is not wholly unexpected and wholesalers, in accord with this situation, have been liquidating their stocks as much as possible and making new purchases only when absolutely necessary. It may be deduced, therefore, that the average maker's December volume will not be large. No price changes have been reported. Deliveries are being effected very satisfactorily.

Plumbers' Brass Goods

Practically the only buying interest in this commodity being displayed by wholesalers is in the anticipation of their early 1928 requirements, but makers are not especially enthusiastic over the number of such specifications received thus far. Present consumption of brass goods is not pronounced, and there are generally ample supplies in jobbers' hands to satisfy existing demand. Inventories, however, are being lightened with the approach of the new year and stock taking time, consequently shipments from sources have been reduced to a minimum. Several cast brass manufacturers withdrew prices during the week.

Range Boilers

Range boiler production is at a high level for this season of the year for wholesalers have taken into their stocks and have contracted ahead for considerable quantities, which actions were stimulated by the price advances of October 1 and December 10. Specifications were ac-

(Continued on Page 78)

The Stock Market

Quotations furnished by Frazier, Jelke & Co., Chicago

Par Value	1927 High	1927 Low	Quotations of December 19, 1927	•	Bid	Asked	Last
25	147⅞	110½	American Radiator Co., com.	A	133	133½	133
100	138½	132½	American Radiator Co., pfd.	A	138¼	139¼	138½
50	58	41½	Anaconda Copper Mining Co.	A	58	59	58
NP	35⅞	26	Brunswick-Balke-Collender Co.	A	34¾	35	34¾
NP	92	42	A. M. Byers Co., com.	A & F	90⅞	91⅜	90⅞
100	115	108¾	A. M. Byers Co., pfd.	A & F	111	111⅜	111
100	138	115½	Century Electric Co., com.	G	137	140	138
100	106	101	Century Electric Co., pfd.	G	100	103	101
50	48	4	Chicago Nipple Mfg. Co., "A"	B	6	7	6
50	38¼	1	Chicago Nipple Mfg. Co., "B"	B	3	5	3
25	53	46⅛	Crane Company, com.	C	47	47½	47
100	121	116½	Crane Company, pfd.	C	119	120	119½
100	95	84½	Detroit Brass & Malleable Works	D	85	95	90
100	109	106	The John Douglas Co., pfd.	I	108	110	.....
20	30	24	Eagle-Picher Lead Co.	I	24½	25	24½
NP	43½	30¾	Fairbanks, Morse & Co., com.	A	34	36	34
100	112	107	Fairbanks, Morse & Co., pfd.	A	107	109	108
NP	126	60	Johns-Manville Corp.	B	124½	125	124½
100	161	100	Jones & Laughlin, com.	F	155	.....	156
100	122	115	Jones & Laughlin, pfd.	F	120	121	120
10	21	16	Michigan Copper & Brass Co.	D	19	21	19½
NP	33½	32½	Minneapolis-Honeywell Regulator Co.	B	32	32½	32¼
100	135	95	National Lead Co., com.	A	130	132	130
100	139½	129½	National Lead Co., pfd.	A	139	140	139
NP	39½	36	National Radiator Corp.	B	38½	39	38½
100	106	102	Ohio Brass Co., pfd.	H	104	106	105
NP	110	80	Ohio Brass Co., "B"	H	110	115	110
NP	....	.....	Pacific Steel Boiler Corp.	B	12	13	12½
25	.....	.....	Pierce, B. & P. Mfg. Corp., com.	U	24	24½	24
100	.....	.....	Pierce, B. & P. Mfg. Corp., pfd.	U	95	99	96
NP	36	21½	Richmond Radiator Co., com.	B	29¾	30¼	29¾
NP	56	41	Richmond Radiator Co., pfd.	B	41	42	41
100	65	51	Scovill Mfg. Co.	U	51	51½	51
25	113	107	Standard San. Mfg. Co., com.	F	108	109	108
100	121	107	Standard San. Mfg. Co., pfd.	F	119	120	119
100	.....	.....	Trenton Potteries Co., com.	U	45	55	45
100	.....	.....	Trenton Potteries Co., pfd.	U	95	105	95
100	244½	190½	U. S. Cast Iron P. & F. Co., com.	A	218	219	218
100	125	112	U. S. Cast Iron P. & F. Co., pfd.	A	122	123	122
NP	42	36½	U. S. Radiator Corp., com.	D	39	41	40
100	112	95¾	U. S. Radiator Corp., pfd.	D	100	.....	102
100	63⅛	37⅛	U. S. Rubber Co., com.	A	57⅝	58⅜	57⅝
100	111⅜	85¾	U. S. Rubber Co., pfd.	A	104	105	104
100	160½	111¾	U. S. Steel Corp., com.	A	149	149½	149⅛
100	139	129	U. S. Steel Corp., pfd.	A	138⅝	139¼	138⅝
NP	27	17½	Walworth Company	A	17¾	18¼	17⅝
NP	16⅜	7	Williams Oil-O-Matic Htg. Corp.	C	8	9	8
NP	7	1¾	Wolff Mfg. Corp.	C	1¾	1¾	1¾
NP	94	60¼	Youngstown Sheet & Tube Co.	A	95⅜	96¼	95⅜

•Where listed—

A—New York Stock Exchange
B—New York Curb Exchange
C—Chicago Stock Exchange
D—Detroit Stock Exchange
E—Boston Stock Exchange
F—Pittsburgh Stock Exchange
G—St. Louis Stock Exchange
H—Cleveland Stock Exchange
I—Cincinnati Stock Exchange
U—Unlisted Stocks

The Metal Market

	Dec. 20	Average Nov., 1927	Average Sept., 1927	Average 1926
PIG IRON—				
No. 2 foundry, Chicago, Furnace	$18.50	$18.50	$19.50	$21.65
PLATES AND SHEETS—				
Steel boiler plates, Pittsburgh, per lb.	1.80c	1.75c	1.80c	1.89c
Blue annealed sheets, No. 10, Pittsburgh, per lb.	2.10c	2.10c	2.25c	2.40c
Black sheets, No. 24, Pittsburgh, per lb.	2.75c	2.80c	3.00c	3.17c
TIN—				
Straits tin	58½c			
LEAD—				
Chicago	6.20c			

The Old Metal Market

Dealers' Buying Prices

	Per lb.		Per lb.
Aluminum clippings	17½c	Copper, light	9¾c
Block tin	54½c	Copper, uncrucibled wire	11⅜c
Brass, light	6¼c	Faucets and valves	9¼c
Brass, heavy mixed	7⅜c	Lead, heavy	5.50c
Brass, red	9⅜c	Solder joints	10½c
Copper, crucible	11⅜c		

NOTE: Prices are those quoted on Tuesday of this week.

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Never-Split
Varnished Wood Seats

The Label That Means The Most
in the wood seat industry

For nearly a quarter of a century the Never-Split Wood Seat has stood as the standard of comparison throughout the industry. The company that makes them, makes nothing but toilet seats. All its resources are devoted to producing the finest seats that can be built.

Because *more* Never-Split Seats are made and sold than any other brand, important production economies are possible. As a result you can sell an extraordinary seat for the price of an ordinary seat—*and reap full profit.*

Let us send you samples and interesting information about our trade-building service on the Never-Split Complete Line of toilet seats.

NEVER SPLIT SEAT COMPANY
Founded 1905
Dept. 212 Evansville, Ind., U. S. A.

EVERNU Hard Rubber Seats

The perfect seat where hard usage is expected and long term economy is important. Special hard rubber molded by the patented Evernu process into a seamless, jointless, everlasting unit. Practically indestructible.

Easily cleaned with diluted alcohol. Jet black or mahogany. Models for every type of bowl. Unconditionally guaranteed.

No. 120

Varnished Wood and White "Duco"

Made of finest selected oak and gum, kiln dried. So accurate are the joints and so vise-like the grips of the special bolts, that these seats can never split or come apart. In mahogany and natural grains, and all-white "Duco."

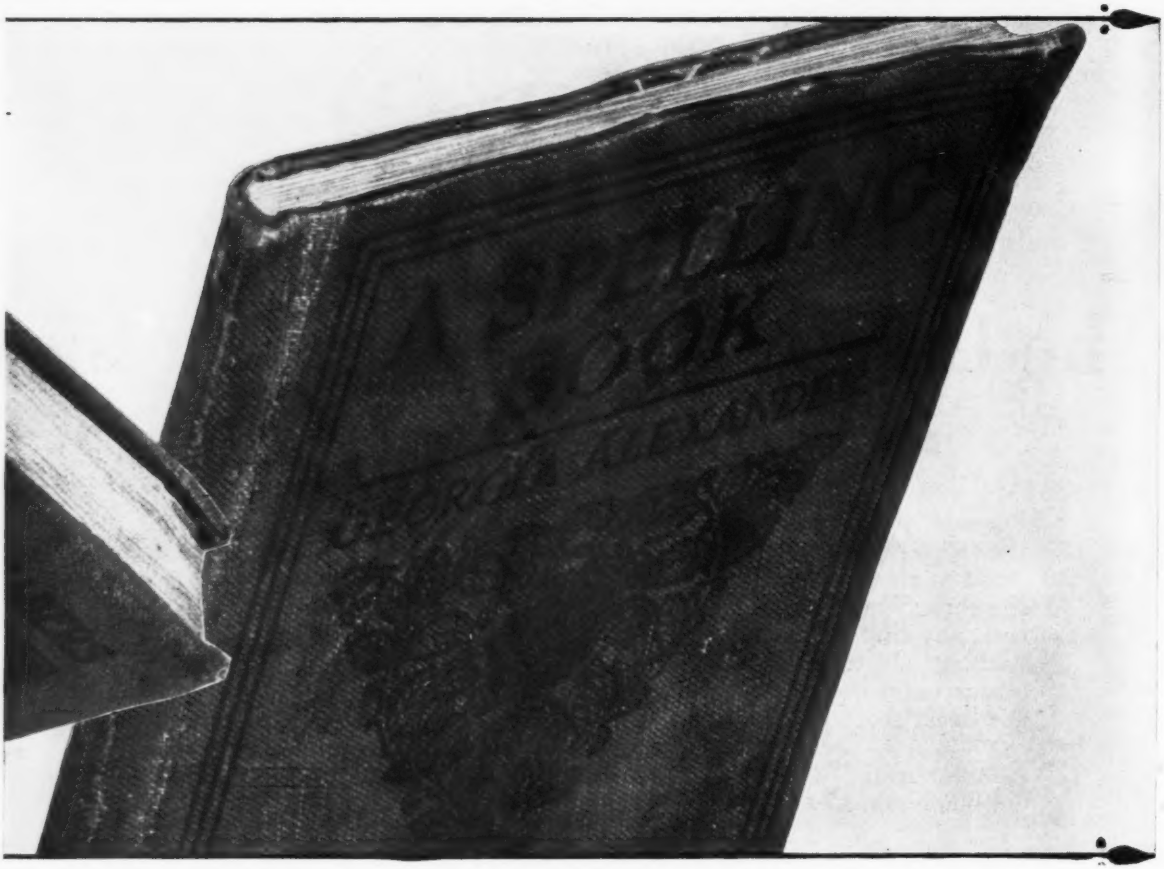
PERMA-WHITE and COLORO—Sheet Covered

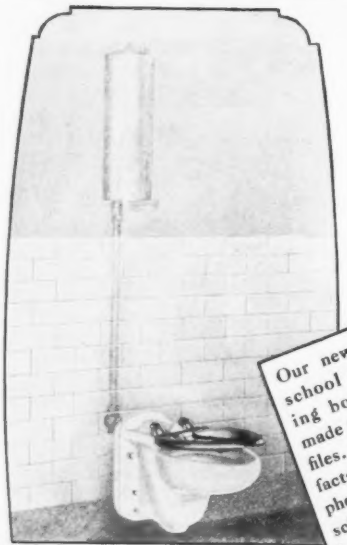
Extra heavy pyralin, reinforced at points of wear, eliminates cracking, splitting or peeling. Washing with hot or cold water and soap won't change its color. Perma-White finished in glistening pure white. Coloro finished in pastel blues, greens, yellows and brighter shades to match any decorative scheme.

NEVER-SPLIT SEATS

"Perma-White" Sheet Pyralin | "Coloro" Tinted Sheet Pyralin | "Evernu" Hard Rubber | White "Duco" Sprayed Pyralin | Varnished Wood Patented Construction

When school books are closed—





Our new Clow school plumbing booklet is made to fit your files. It contains facts, figures and photographs on school and plant hygiene. May we send you a copy?

The Clow Automatic Wall-Hung style. Closed top tank concealed in utility corridor. Reinforced, open front seat. Bowl securely hung.

Do children think of play —or closet hygiene?

When boys forget meals—can they be expected to remember closet chains and levers?

And, an unflushed closet wreaks havoc. Colds, diseases—sometimes death—are often the direct result of contaminated, ill-smelling, unflushed closets.

The Clow Automatic watches over forgetful school children. Never failing, never forgetting—after every occupation, the Clow Automatic flushes itself. Each time, a decisive flush "scrubs" the bowl from top to trap.

Clow Automatics are taintless at the end of a busy day—as taintless at the close of a busy quarter century. They can't forget.

The Clow-Madden valve is simple. It uses less water each flush—from three to seventeen gallons less than other closets.

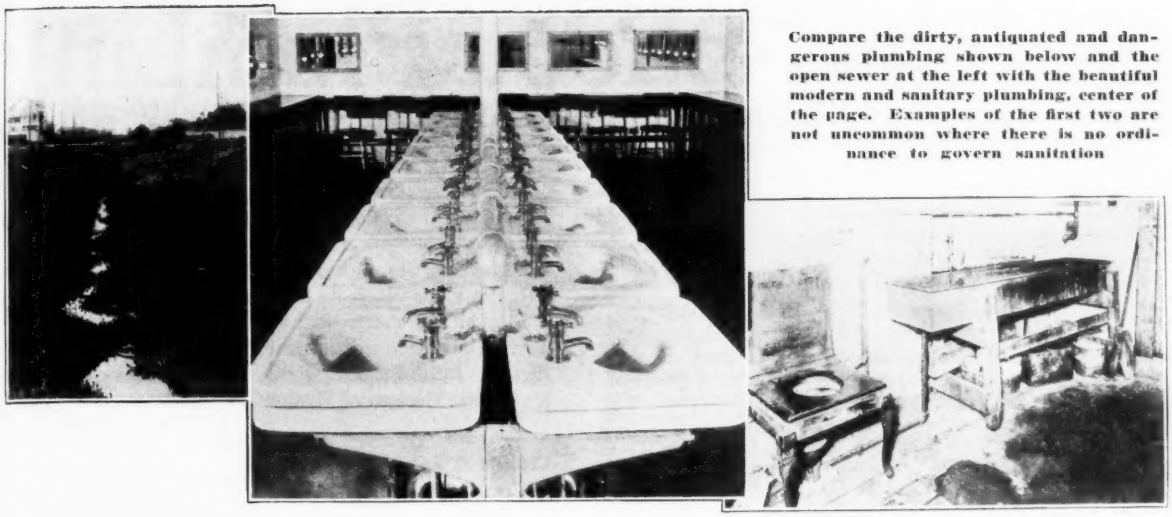
Clow Automatics mean sure sanitation for the next quarter century. They age slowly with the building and their upkeep cost figures are as small as their age figures are large.

James B. Clow & Sons
201-299 North Talman Ave., Chicago

CLOW AUTOMATIC

Never, Never Forgets

Forty-eight Styles, Heights and Types to Meet Your Requirements



Compare the dirty, antiquated and dangerous plumbing shown below and the open sewer at the left with the beautiful modern and sanitary plumbing, center of the page. Examples of the first two are not uncommon where there is no ordinance to govern sanitation

874 Plumbing Ordinances

THE NATIONAL Trade Extension Bureau published recently, a report which is the result of a survey of plumbing regulations and inspection in 1,215 cities, towns and communities of the United States. This report shows that 874 of the 1,215 places have a plumbing ordinance of some kind, while 341 report no plumbing regulations at all. The Bureau wishes it understood that this report is based upon the information it was able to procure. Supreme efforts were made to get complete information but there may be omissions on account of failure to reply to their communications.

A valuable feature of the report is that which gives the names of plumbing inspectors in 818 of the 874 places that have a plumbing code. It is believed by the Bureau that this should be of great assistance to manufacturers, wholesalers, master plumbers' associations and other groups of master plumbers.

The report is made up of 52 mimeographed pages and may be procured from the National Trade Extension Bureau for $2.00.

Of the 874 communities reporting a plumbing ordinance (including codes that are being enforced as well as partial ordinances and those reported as not being enforced), 818 places or 93.6 per cent claim to have a plumbing inspector, while 56 places or 6.4 per cent have none.

The plumbing inspector is known by that title in 704 of the 818 places reporting such an official. In the 114 communities where the plumbing inspector is not known by that title, the inspection of plumbing is reported to be in charge of:

City Engineer	in 40 cities	Superintendent Public Works	in 2 cities
Bldg. Inspector	in 29 cities	Sanitary Inspector	in 1 city
Water Superintendent	in 21 cities	General Inspector	in 1 city
Water Commissioner	in 4 cities	City Supt.	in 1 city
Water and Light Superintendent	in 3 cities	Borough Engineer	in 1 city
Bldg. Commissioner	in 3 cities	Supt. of Bldgs.	in 1 city
Street Superintendent	in 2 cities	Bldg. and Fire Inspr.	in 1 city
Commissioner Public Works	in 2 cities	Water and Sewer Supt.	in 1 city
		Sewer Inspr.	in 1 city

Of the 818 communities reporting a plumbing inspector, this official is shown to work—

Under the—			
Health Dept.	in 466 cities	City Commrs. Dept.	in 5 cities
Building Dept.	in 215 cities	City Manager	in 5 cities
Water Dept.	in 44 cities	Sewer Department	in 4 cities
Engineering Dept.	in 28 cities	Street and Sewer Dept.	in 2 cities
Public Works Dept.	in 18 cities	Finance Dept.	in 1 city
Public Safety Dept.	in 8 cities	Electrical Dept.	in 1 city
Water and Light Dept.	in 6 cities	Public Utility Dept.	in 1 city
Water and Sewer Dept.	in 6 cities	Public Welfare Dept.	in 1 city
Street Dept.	in 5 cities	Public Buildings Dept.	in 1 city
		Mayor	in 1 city

According to the report, responsibility for observance of sanitary regulations, in the 392 communities reporting no plumbing inspector, rests with

Health Board or Health Official	in 197 places
City Engineer	in 7 places
Water Department	in 6 places
City Manager	in 5 places
Borough Engineer	in 1 place
Chief of Police	in 1 place
City Council	in 1 place
City Clerk	in 1 place
Commissioner of Safety	in 1 place
Service Director	in 1 place
Commr. of Public Works	in 1 place
No one	in 170 places

The report goes on to say that the study indicates that communities, as a rule, recognize the importance of having the plumbing inspector work under the jurisdiction of the health department. That is where the responsibility for observance of sanitary regulations should lie or rest, because of the very close and intimate relationship between modern plumbing and health and sanitation.

PLUMBING A HEALTH MEASURE

AMERICAN plumbing is designed on the theory that the chief function of a plumbing system is to provide safe running water to plumbing fixtures and to carry away human excreta and domestic wastes. The plumbing system is a safe water supply and a sewerage system; and to neglect or slight its importance may nullify the results that are sought to be obtained by providing either or both.

Good plumbing is a matter which concerns health. The government has the right to protect the people's health.

(Continued on Page 66)

Special Notice to Plumbing

Domestic Engineering Cooperation with the Plumbing and

The manufacturers here listed have authorized us to send to the plumbing and heating contractors, upon request, their standardized catalog sheets for use in the standardized binders distributed through the National Trade Extension Bureau.

These loose sheets are reprints of catalog pages appearing in "Domestic Engineering Catalog Directory." They conform to your industries' standardized catalog page size 8½x10⅝ inches—printed on a good grade of light paper and punched to fit the binder.

If you are assembling a working catalog from standardized catalog sheets, write Domestic Engineering Co., 1900 Prairie Avenue, Chicago, on your letterhead, giving the names of concerns listed below whose lines you are interested in, and we shall be glad to send you the sheets without charge. If you are not using the standardized sheets and binder and wish further information, write to the National Trade Extension Bureau of Evansville, Indiana.

Abendroth Bros. ..... Port Chester, N. Y.
Acme Adjustable Pipe Hanger Mfg. Co. ..... Richmond, Va.
Acme Asbestos Covering & Flooring Co. ..... Chicago, Ills.
Acme Frost Proof Closet Mfg. Co. ..... Baltimore, Md.
Albrass Co. ..... Coxsackie, N. Y.
Allen Mfg. Co., W. D. ..... Chicago, Ill.
American Brass Co. ..... Waterbury, Conn.
American Manganese Bronze Co. ..... Holmesburg, Pa.
American Pipe Tool Co. ..... Chicago, Ills.
American Radiator Co. ..... Chicago, Ills.
American Spiral Pipe Works ..... Chicago, Ills.
American Steam Pump Co. ..... Battle Creek, Mich.
Armstrong Bros. Tool Co. ..... Chicago, Ills.
Armstrong Mfg. Co. ..... Bridgeport, Conn.
Artisan Metal Products Co. ..... Charlestown, Mass.
Atlas Brass Foundry Co. ..... Columbus, Ohio
Automatic Gas Steam Radiator Co. ..... Pittsburgh, Pa.
Badger & Sons Co., E. B. ..... Boston, Mass.
Barnes Tool Co., The ..... New Haven, Conn.
Barrett Mfg. Co., James ..... Boston, Mass.
Bashlin Co. ..... Warren, Pa.
Bay Ridge Specialty Co., Inc. ..... Trenton, N. J.
Beaton & Cadwell Mfg. Co., The ..... New Britain, Conn.
Beaton & Corbin Mfg. Co., The ..... Southington, Conn.
Becker Mfg. Co., The ..... Marietta, Ohio
Beneke Mfg. Co. ..... Chicago, Ills.
Benson Co., Inc., Alex R. ..... Hudson, N. Y.
Bignall Co., The ..... Medina, N. Y.
Blake Specialty Co. ..... Rock Island, Ills.
Blue Seal Chemical Co. ..... Roselle, N. J.
Boosey Mfg. Co., Norman ..... Detroit, Mich.
Borden Co., The ..... Warren, Ohio
Bradley Washfountain Co. ..... Milwaukee, Wis.
BRE Mfg. Co. ..... Boston, Mass.
Bridgeport Brass Co. ..... Bridgeport, Conn.
Brunswick-Balke-Collender Co., The ..... Chicago, Ills.
Brunswick-Kroeschell Company ..... Chicago, Ill.
Buckeye Pump & Mfg. Co. ..... Columbus, Ohio
Buffalo Gas Radiator Corp. ..... No. Tonawanda, N. Y.
Burnham Boiler Corp ..... Irvington, N. Y.
Butler Mfg. Co. ..... Minneapolis, Minn.
Butler, Thos. F. ..... Lorain, Ohio
Cabco Iron Works, Inc. ..... Gowanda, N. Y.
Capitol Brass Works ..... Detroit, Mich.
Carty & Moore Engineering Co. ..... Detroit, Mich.
Case & Son Mfg. Co., W. A. ..... Buffalo, N. Y.
Celina Mfg. Co ..... Celina, Ohio
Central Radiator Co. ..... New York City
Chamberlain Co., The ..... Pittsburgh, Pa.
Chemical Toilet Corp. ..... Syracuse, N. Y.
Chicago Faucet Co., The ..... Chicago, Ills.
Chicago Granitine Mfg. Co. ..... Chicago, Ills.
Chicago Pipethread Machine Co. ..... Racine, Wis.
Chipman Chemical Engineering Co., Inc. ..... Bound Brook, N. J.
Cleveland Brass Mfg. Co., The ..... Cleveland, Ohio
Cleveland Heater Co. ..... Cleveland, Ohio
Columbia Radiator Co. ..... McKeesport, Pa.
Comet Radiator Co. ..... Philadelphia, Pa.
Commonwealth Brass Corp. ..... Detroit, Mich.
Compound Injector & Specialty Co. ..... Chicago, Ills.
Conemaugh Iron Works ..... Latrobe, Pa.
Coyne & Delaney Co. ..... Brooklyn, N. Y.
Crampton-Farley Brass Co. ..... Kansas City, Mo.
Crist & Schilken Co. ..... Pittsburgh, Pa.
Crocker Chair Co. ..... Sheboygan, Wis.
Croll & Son, Jesse G. ..... Philadelphia, Pa.
Crowell, F. G. ..... Buffalo, N. Y.
Crown Die & Tool Co. ..... Chicago, Ills.
Curtin Valve Co., A. F. ..... Medford, Mass.
Curtis & Curtis Co., The ..... Bridgeport, Conn.
Curtis Specialty Co. ..... Salt Lake City, Utah
Dahlquist Mfg. Co. ..... South Boston, Mass.
Dail Steel Products Co. ..... Lansing, Mich.
Dart Mfg. Co., E. M. ..... Providence, R. I.
Dash Mfg. Co. ..... New York City
Davis Engineering Corp. ..... New York City
Decatur Pump Co. ..... Decatur, Ills.
Dececo Co., The ..... Boston, Mass.
Detroit Lubricator Co. ..... Detroit, Mich.
Detroit Torch & Mfg. Co. ..... Detroit, Mich.
Dick Brothers, Inc. ..... Reading, Pa.
Dixie Flashing Co., Inc ..... Birmingham, Ala.
Dixie Metal Products Co., Inc. ..... Birmingham, Ala.
Dole Valve Company ..... Chicago, Ill.
Donley Mfg Co., The ..... Cleveland, Ohio
Donnelly Mfg. Co. ..... Malden, Mass.
Dube Boiler Co. ..... Chicago, Ills.
Dunham Co., The ..... Berea, Ohio
Eastern Foundry Co., The ..... Boyertown, Pa.
Ebinger Sanitary Mfg. Co., D. A. ..... Columbus, Ohio
Economy Heater Co. ..... Chicago, Ills.
Economy Pumping Machinery Co. ..... Chicago, Ill.
Electro Engineering Co., Inc. ..... Richmond Hill, N. Y.
Eljer Co. ..... Ford City, Pa.
Elkhart Iron Works ..... Elkhart, Ind.
Emerson & Sack, Inc. ..... Boston, Mass.
Enterprise Brass Works ..... Muskegon, Mich.
Estabrook's Sons, R. ..... South Boston, Mass.
Evans, Morgan ..... Pittston, Pa.
EverHot Heater Co ..... Detroit, Mich.
Everitt Co., The ..... Boston, Mass.
Excelso Products Corp. ..... Buffalo, N. Y.
Exeter Brass Works ..... Exeter, N. H.
Flagg & Co., Inc., Stanley G. ..... Philadelphia, Pa.
Florence Stove Co. ..... Boston, Mass.
Fritz Manufacturing Co ..... Chicago, Ills.
Gerard Mfg. Co. ..... Dickson City, Pa.
Gerstein & Cooper ..... So. Boston, Mass.
Gerstein & Sons, H. ..... South Boston, Mass.
Gleockle, Jr., A. F. ..... Rochester, N. Y.
Glore & Son, Inc., Evins F. ..... New York City
Goulds Pumps, Inc. ..... Seneca Falls, N. Y.
Grand Haven Brass Foundry ..... Grand Haven, Mich.
Graves, W. L. ..... Hatfield, Mass.
Greenfield Tap & Die Corp. ..... Greenfield, Mass.
Grinnell Co., Inc. ..... Providence, R. I.
Haas Co., Philip ..... Dayton, Ohio
Hammond Brass Works ..... Hammond, Ind.
Handon Boiler Corp. ..... New York City
Hays Mfg. Co ..... Erie, Pa.
Healey Brass Foundry Co., Peter ..... Evansville, Ind.
Healy-Ruff Company ..... St. Paul, Minn.
Heap & Sons, Wm. ..... Grand Haven, Mich.
Hercules Chemical Co., Inc. ..... New York City
Hetzel, J. G., Estate of ..... Newark, N. J.
Hindley Mfg. Co. ..... Valley Falls, R. I.
Hoffman Specialty Co. ..... Waterbury, Conn.
Hollands Mfg. Co. ..... Erie, Pa.
Holyoke Heater Co. ..... Holyoke, Mass.
Honeywell Heating Specialties Co. ..... Wabash, Ind.
Hotstream Heater Co. ..... Cleveland, Ohio
Hudson Brass Works, Inc. ..... Brooklyn, N. Y.
Ideal Pump Co. ..... Detroit, Mich.

and Heating Contractors

Heating Industries' Catalog Standardization Movement

Illinois Engineering Company.....Chicago, Ill.
Imperial Brass Mfg. Co.....Chicago, Ills.
Ireland & Matthews Mfg. Co.....Detroit, Mich.
J. R. S. Specialties Mfg. Co., Inc.....Patchogue, N. Y.
Jefferson Union Co.....Lexington, Mass.
Jenkins Brothers.....New York City
Johns-Manville Corp.....New York City
Johnson Mfg. Co.....Detroit, Mich.
Johnson-Washburn Co.....Boston, Mass.
Jones Hollow Ware Co.....Baltimore, Md.
Josam Mfg. Co.....Cleveland, Ohio
Juvenile Wood Products, Inc.....Fort Wayne, Ind.
Keeney Mfg. Co., The.....Newington, Conn.
Kelly Valve Co.....Grand Haven, Mich.
Kemp Mfg. Co., C. M.....Baltimore, Md.
Kennedy Valve Mfg. Co.....Elmira, N. Y.
Kent Co., F. C.....Irvington, N. J.
Kewanee Boiler Company.....Kewanee, Ill.
Keystone Brass Works.....Erie, Pa.
Keystone Pottery Co.....Trenton, N. J.
Kitson Co.....Philadelphia, Pa.
Knott Mfg. Co.....Tell City, Ind.
Kokomo Sanitary Pottery Co.....Kokomo, Ind.
Kortick Manufacturing Co.....San Francisco, Cal.
Koven & Bro., L. O.....Jersey City, N. J.
Kretschmer Mfg. Co.....Dubuque, Iowa
Kupferle Foundry Co., John C.....St. Louis, Mo.
Lambertville Pottery Co.....Lambertville, N. J.
Landon Radiator Company.....North Tonawanda, N. Y.
Lavelle Rubber Co.....Chicago, Ills.
Lawson Co., The F. H.....Cincinnati, Ohio
Lawson Mfg. Co.....Cleveland, Ohio
Leavitt Machine Co.....Orange, Mass.
Lehman Sprayshield Co.....Philadelphia, Pa.
Lenk Mfg. Co.....Boston, Mass.
Leonard-Rooke Co.....Providence, R. I.
Liquid Veneer Corp.....Buffalo, N. Y.
Lissberger & Son, Inc., Marks.....Long Island City, N. Y.
Little Giant Mfg. Co.....Minneapolis, Minn.
Luzerne Rubber Co., The.....Trenton, N. J.
Lytton Mfg. Corp.....Franklin, Va.
McCoy Mfg. Co., Inc.....Garwood, N. J.
McGurrin Supply Co.....Grand Rapids, Mich.
Maddock's Sons Co., Thomas.....Trenton, N. J.
Malleable Iron Fittings Co.....Branford, Conn
Manning, Maxwell & Moore, Inc.....New York City
Mfg. Equipment & Engineering Co.....Framingham, Mass.
Martin & Sons, H. P.....Owensboro, Ky.
Marvel Machine & Brass Works.....Cleveland, Ohio
Meneley-Diederich Co., Inc.....Los Angeles, Cal.
Michigan Pipe Co.....Bay City, Mich.
Milford Iron Foundry.....Milford, Mass.
Milwaukee Valve Co.....Milwaukee, Wis.
Minneapolis Heat Regulator Co.....Minneapolis, Minn.
Misener & Irving Mfg. Co., Inc.....Syracuse, N. Y.
Modern Utilities Co.....Harrisburg, Pa.
Modine Mfg. Co.....Racine, Wis.
Molby Boiler Co.....New York City
Morton Mfg. Co.....Chicago, Ills.
Muller, Edward.....North Bergen, N. J.
Nash Engineering Co.....So. Norwalk, Conn.
Nason Mfg. Co.....New York City
National Steel Tank & Mfg. Co.....Bradford, Ills.
Neptune Meter Co.....New York City
Newell Mfg. Co.....Irwin, Pa.
Northwestern Chemical Co., The.....Marietta, Ohio
Nustone Products Corp.....Union City, N. J.
Nye Tool & Machine Works.....Chicago, Ills.
Ohio Brass Co.....Mansfield, O.
Ohio Heater Co., The.....Columbus, Ohio
Paine Co.....Chicago, Ills.
Para Rubber Co.....Newark, N. J.
Penn Engineering Co., The.....Philadelphia, Pa.
Perfection Stove Co.....Cleveland, Ohio
Phoenix Brass Foundry.....Irvington, N. J.
Pittsburgh Engineering Co.....Jeannette, Pa.
Plummer-Huff Company.....Napoleon, Ohio
Plomb Tool Co.....Los Angeles, Cal.
Polygon Products Co.....Boston, Mass.
Porcela-Radax Co.....Pittsburgh, Pa.
Powers Regulator Co.....Chicago, Ills.
Providence Fittings Co., The.....Boston, Mass.
Radiator Specialty Co.....Charlotte, N. C.
Randolph-Clowes Co., The.....Waterbury, Conn.
Rawlplug Co., Inc., The.....New York City
Reading Brass Works.....Reading, Pa.
Reed Mfg. Co.....Erie, Pa.
Reeves Specialty Co.....Denver, Colo.
Reinhart Mfg. Co., Edwin G.....Cincinnati, Ohio
Rhode Island Fittings Co.....Providence, R. I.
Richmond Engineering Co.....Richmond, Va.
Richmond Foundry & Mfg. Co., Inc.....Richmond, Va.
Richmond Radiator Co.....New York, City
Ridge Tool Co.....Elyria, Ohio
Riverside Boiler Works, Inc.....Cambridge, Mass.
Riverside Foundry & Galvanizing Co.....Kalamazoo, Mich.
Roberts Brass Mfg. Co., The.....Detroit, Mich.
Robinson Mfg. Co., The.....Cleveland, Ohio
Rockford Brass Works.....Rockford, Ills.
Royal Brass Mfg. Co., The.....Cleveland, Ohio
Rumsey Pump Co., Ltd.....Seneca Falls, N. Y.
Russell Appliance Co.....Springfield, Mass.
Russell Mfg. Co., Inc., John M.....Naugatuck, Conn.
Russell & Co., W. A.....New York City
Rutland Fire Clay Co.....Rutland, Vt.
Sands Mfg. Co.....Cleveland, Ohio
Sanitary Bath Curtain Mfg. Co., Inc.....New York City
Sanitas Mfg. Co.....Boston, Mass.
Sarco Co., Inc.....New York City
Scaife & Sons Co., Wm. B.....Oakmont, Pa.
Scott Valve Mfg. Co.....Detroit, Mich.
Sherwood Brass Works.....Detroit, Mich.
Simplex Boiler Stand Co.....Brooklyn, N. Y.
Simplex Mfg. Co.....Chicago, Ills.
Sloan Valve Company.....Chicago, Ill.
Smith, Inc., H. Romeyn.....New York City
Standard Stone Co.....Brooklyn, N. Y.
Standard Tank & Seat Co.....Camden, N. J.
Standard Union Co.....Boston, Mass.
Standard Water Systems Co. of N. J.....Hampton, N. J.
Stark Pump Co.....Detroit, Mich.
Sterling Faucet Co.....Newcomerstown, Ohio
Stringer Brothers Co.....Chicago, Ills.
Structural Slate Co.....Pen Argyl, Pa.
Superbestos Co., The.....Chicago, Ills
Swett Iron Works, A. L.....Medina, N. Y.
Taylor Co., Halsey W., The.....Warren, Ohio
Teck Manufacturing Co.....Chicago, Ills.
Test-Tite Co.....Philadelphia, Pa.
Thatcher Co.....Newark, N. J.
Thermal Appliance Co., Inc.....New York City
Tillery's Little Janitor Clock Co.....Newark, N. J.
Toledo Pipe Threading Machine Co.....Toledo, Ohio
Trageser Steam Copper Works, John.....Maspeth, N. Y.
Trenjer Specialty Co.....Trenton, N. J.
Trenton Brass & Machine Co.....Trenton, N. J.
Tryco Products, Inc.....Westfield, Mass.
Universal Smokeless Boiler Co.....Ravenna, Ohio
Van Arnam Mfg. Co.....Fort Wayne, Ind.
Vanderman Mfg. Co.....Willimantic, Conn.
Vinco Co., Inc.....New York City
Vogel Co., Joseph A.....Wilmington, Del.
Wade Iron Sanitary Mfg. Co.....Chicago, Ills.
Walker Dishwasher Corp.....Syracuse, N. Y.
Walworth Company.....Boston, Mass.
Ware Coupling & Nipple Co.....Ware, Mass.
Warnock Manufacturing Co.....Worcester, Mass.
Warren Tool & Forge Co.....Warren, Ohio
Washington Metal Products Co.....Washington C. H., Ohio
Watts Regulator Co.....Lawrence, Mass.
Wesely Co., Chas.....Chicago, Ills.
Wessels & Sons, D. D.....Detroit, Mich.
Western Wire Products Co.....St. Louis, Mo.
Wheeling Machine Products Co.....Wheeling, W. Va.
White Flushing Valve Mfg. Co.....Denver, Colo.
White Steel Sanitary Furniture Co.....Grand Rapids, Mich.
Whitlock Coil Pipe Co.....Hartford, Conn.
Wilks Mfg. Co., S.....Chicago, Ills.
Williams, George E.....Minneapolis, Minn
Williams & Co., J. H.....Buffalo, N. Y.
Wood Mfg. Co., John.....Conshohocken, Pa.
Woodward-Wanger Co.....Philadelphia, Pa
Worcester Brush & Scraper Co.....Worcester, Mass
"X" Laboratories.....New York City
Yeomans Brothers Co.....Chicago, Ills.
Yost Mfg. Co.....Meadville, Pa.

The legal principle involved is that the control of plumbing by government is distinctly an act done under the police power, because it has to do with the protection of the health of the people against injury.

While it is true that plumbing is installed in buildings, there is very little direct relation between plumbing regulations and building regulations. The plumbing in the building does not have to do with the thickness of the walls or general safety of the structure, but is installed for the comfort, convenience and health of the occupants. Its only relation to building construction would be: (1) Cutting bearings to house pipes; (2) Piercing fire walls with pipes; (3) Undermining foundations or footings to receive house drains or house sewers. But by far its most important bearing is upon the health of the occupants.

All other regulations with reference to plumbing installation have to do with the health of the occupants of the building; and the factor of safety involved is one of health and not of building construction. Statistics and records will prove conclusively that wherever the health factor of safety has been lowered, people have paid in life and dollars.

The Bureau believes that a clear understanding must be had upon this point as there has been a false theory taught by some of our leading sanitarians that plumbing has no relation to health. They make this statement because of some prominent men who assume that American plumbing is based upon the theory of sewer gas. Sewer gas, sewer air, or sewer vapor is a secondary consideration and is seldom found in well-constructed plumbing and drainage systems. Sewer air may not contain harmful bacteria, but often contains gases that are poisonous to the human system and if taken in large amounts will result in ill health and perhaps death. Therefore, the air of sewers or drains should be kept from entering buildings intended for human habitation or occupancy, by the use of proper plumbing installations.

This information should enable associations and groups of master plumbers to cause their city officials to see the wisdom—in fact the necessity—of having the plumbing inspector work under the supervision of the health department as well as of placing responsibility for observance of sanitary regulations with the board of health in communities having no plumbing inspector.

Following are the cities, towns and communities that are reported as having plumbing ordinances:

Eight Hundred and Seventy-four Plumbing Ordinances

Alabama
Albany
Bessemer
Birmingham
Decatur
Florence
Gadsden
Mobile
Montgomery
Selma
Sheffield
Troy
Tuscaloosa

Arizona
Bisbee
Douglas
Globe
Miami
Nogales
Phoenix
Tucson

Arkansas
Fayetteville
Fort Smith
Helena
Hot Springs
Jonesboro
Little Rock
Magnolia
Pine Bluff

California
Alhambra
Anaheim
Bakersfield
Berkeley
Beverly Hills
Eureka
Fullerton
Glendale
Long Beach
Los Angeles
Martinez
Marysville
Modesto
Monrovia
Oakland
Ontario
Pasadena
Petaluma
Pomona
Redondo Beach
Richmond
Riverside
Sacramento
San Bernardino
San Diego
San Francisco
San Jose
San Leandro
San Mateo
San Pedro
San Rafael
Santa Ana
Santa Barbara
Santa Monica
Stockton
Venice
Ventura
Watsonville
Whittier

Colorado
Boulder
Colorado Springs
Denver
Fort Collins
Grand Junction
Greeley
Longmont
Pueblo
Trinidad

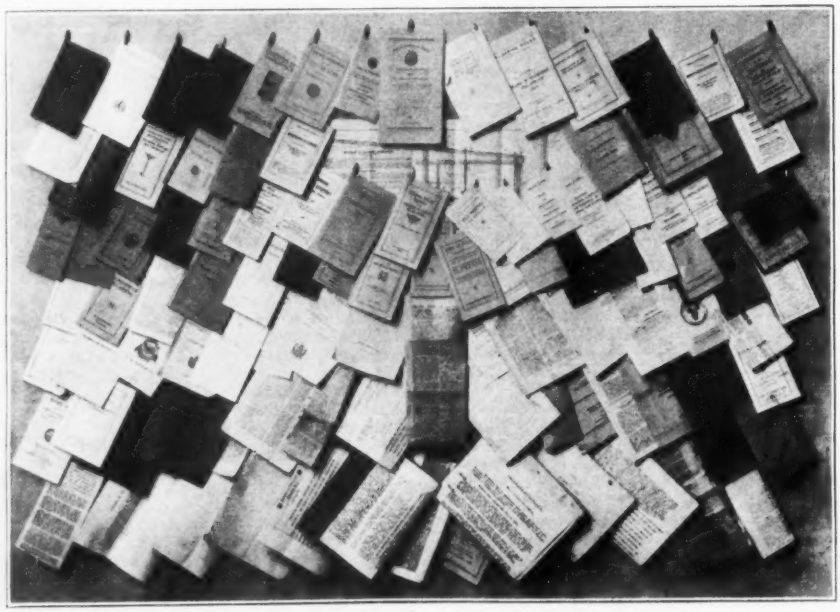
Connecticut
Ansonia
Bridgeport
Bristol
Derby
East Hartford
Fairfield
Greenwich
Hamden
Hartford
Meriden
Middletown
Milford
New Britain
New Haven
New London
Norwalk
Putnam
Southington
South Manchester
Stamford
Stratford
Torrington
Waterbury
Wallingford
West Hartford
Willimantic

Delaware
Wilmington

Dist. of Columbia
Washington

Florida
Auburndale
Bartow
Boynton
Bradenton
Clearwater
Coral Gables
Daytona Beach
Deland
Fernandino
Ft. Lauderdale
Ft. Myers
Ft. Pierce
Gainesville
Hialeah
Hollywood
Jacksonville
Key West
Kissimmee
Lake City
Lakeland
Lakeworth
Leesburg
Live Oak
Madison
Miami
Miami Beach
Ocala
Okochobee
Orange City
Orlando
Palatka
Panama City
Pensacola
Plant City
St. Augustine
St. Petersburg
Sanford
Sarasota
Stuart
Tallahassee
Tampa
Tavares
Venice
Vero Beach
W. Palm Beach
Winter Park

Georgia
Albany
Americus
Athens
Atlanta
Augusta
Columbus
East Point
Elberton
Gainesville
Griffin
Lagrange
Macon
Newnan
Savannah
Valdosta
Waycross



Typical group of plumbing codes of American states and cities

Idaho

Boise
Caldwell
Coeur d' Alene
Lewiston
Nampa

Illinois

Alton
Aurora
Belleville
Belvidere
Bloomington
Calumet City
Canton
Carbondale
Champaign
Chicago
Chicago Heights
Cicero
Danville
Decatur
DeKalb
East Moline
E. St. Louis
Edwardsville
Elgin
Evanston
Galesburg
Glen Ellyn
Granite City
Highland Park
Hoopeston
Joliet
Kankakee
Kewanee
LaGrange
Lake Forest
Lincoln
Lockport
Madison
Maywood
Metropolis
Moline
Monmouth
No. Chicago
Oak Park
Ottawa
Peoria
Pontiac
Quincy
Rockford
Rock Island
St. Charles
Springfield
Staunton
Urbana
Waukegan
W. Frankfort
Zion

Indiana

Connersville
Crawfordsville
E. Chicago
Elkhart
Evansville
Fort Wayne
Gary
Hammond
Huntington
Indianapolis
LaPorte
Logansport
Muncie
New Castle
South Bend
Terre Haute

Iowa

Ames
Boone
Burlington
Cedar Falls
Cedar Rapids
Clinton
Council Bluffs
Davenport
Des Moines
Dubuque
Fort Dodge
Fort Madison
Keokuk
Marshalltown
Mason City
Newton
Ottumwa
Shenandoah
Sioux City
Waterloo

Kansas

Arkansas City
Atchison
Coffeyville
Dodge City
Eldorado
Emporia
Ft. Scott
Hutchinson
Independence
Iola
Junction City
Kansas City
Lawrence
Leavenworth
Manhattan
Newton
Parsons
Pittsburg
Pratt
Salina
Topeka
Wellington
Wichita
Winfield

Kentucky

Bowling Green
Covington
Danville
Hopkinsville
Lexington
Louisville
Mayfield
Newport
Paducah

Louisiana

Baton Rouge
Bogalusa
Crowley
Lafayette
Lake Charles
Minden
Monroe
New Iberia
New Orleans
Shreveport

Maine

Auburn
Augusta
Bangor
Belfast
Biddeford
Brunswick
Gardiner
Houlton
Lewiston
Portland
Rockland
Rumford
Saco
So. Portland
Waterville
Westbrook

Maryland

Baltimore
Cumberland
Hagerstown

Massachusetts

Adams
Amesbury
Amherst
Andover
Arlington
Athol
Attleboro
Beverly
Boston
Braintree
Bridgewater
Brockton
Brookline
Cambridge
Chicopee
Clinton
Dedham
Easthampton
Everett
Fall River
Fitchburg
Framingham
Franklin
Gardner
Gloucester
Haverhill
Holyoke
Hudson
Hyannis
Lawrence
Leominster
Lexington
Lowell
Lynn
Malden
Mansfield
Marlboro
Medford
Melrose
Methuen
Milton
Natick
New Bedford
Newburyport
Newton
North Adams
Northampton
North Andover
North Attleboro
Norwood
Peabody
Pittsfield
Plymouth
Quincy
Reading
Revere
Rockland
Salem
Somerville
Saugus
Springfield
Stoneham
Swampscott
Taunton
Wakefield
Walpole
Waltham
Ware
Watertown
Wellesley
Westfield
Weymouth
Whitman
Winchester
Winthrop
Woburn
Worcester

Michigan

Ann Arbor
Battle Creek
Bay City
Benton Harbor
Detroit
Escanaba
Flint
Grand Haven
Grand Rapids
Hastings
Holland
Iron Mountain
Jackson
Kalamazoo
Lansing
Laurium
Mt. Clemens
Muskegon
Muskegon Heights
Owosso
Pontiac
Royal Oak
Saginaw
Sault Ste. Marie

Minnesota

Duluth
Faribault
Hibbing
Minneapolis
New Ulm
North Mankato
Owatonna
St. Cloud
St. Paul
So. St. Paul
Virginia

Mississippi

Columbus
Hattiesburg
Jackson
Laurel
McComb
Meridian

Missouri

Brentwood
Cape Girardeau
Carthage
Clayton
Clinton
Glendale
Independence
Jefferson
Joplin
Kansas City
Kirkwood
Maplewood
Nevada
Poplar Bluff
Richmond Heights
Sedalia
Springfield
St. Charles
St. Joseph
St. Louis
St. Louis County
University City
Webster Groves

Montana

Anaconda
Billings
Great Falls
Havre
Helena
Lewiston
Livingston
Miles City

PENBERTHY PRODUCTS

Taken, point by point and compared with other devices for similar service, Penberthy Cellar Drainer will do more than hold its own.

It has proven itself capable where other and less reliable cellar drainers had failed.

It's a year round profit item. Not one that requires service or gives your customers the slightest cause for complaint.

PENBERTHY INJECTOR CO.
Established 1886
1260 Holden Avenue, Detroit, Michigan
Canadian Plant: Windsor, Ontario

Our Catalog in

Penberthy
AUTOMATIC
CELLAR DRAINERS

CAPITOL

Plumbers' Brass Goods

Michigan Smelting and Refining Company now operating Capitol Brass Works.

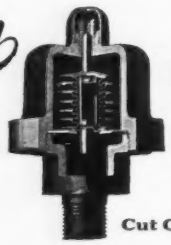
have been added to and improved by consolidation with the line formerly known as "Acme Detroit." Upon request we will be glad to mail you our new catalog just off the press showing the complete line of CAPITOL Plumbers' Brass Goods.

CAPITOL BRASS WORKS

MANUFACTURERS OF BRASS VALVES, BOILER TRIMMINGS AND PLUMBERS' BRASS GOODS

DETROIT, MICH.

Sylphon



No. 527

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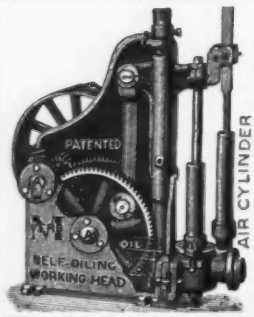

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So. Milwaukee
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Stoughton
Superior
Watertown
Waukesha
Wausau
Wauwatosa
Wisconsin Rapids

Wyoming

Casper
Cheyenne
Laramie

The Schoolmaster Offers Suggestions On Problem Solutions

(Continued from Page 42)

From Santa Ana, Calif.

Figs. 12 and 13.—Here, also, floor plans have been submitted, which show the locations of stacks.

A statement with this elevation indicates that in Santa Ana circuit and loop venting is not allowed. This, of course, is the reason why the water closets and urinals are vented otherwise. All venting outside the water closets is continuous venting.

TABLE OF WATER PRESSURES

Head	Pressure per sq. in.	Head	Pressure per sq. in.	Head	Pressure per sq. in.
1 ft.	.43 lb.	130 ft.	56.31 lb.	260 ft.	112.62 lb.
5 ft.	2.16 lb.	135 ft.	58.48 lb.	265 ft.	114.79 lb.
10 ft.	4.33 lb.	140 ft.	60.64 lb.	270 ft.	116.96 lb.
15 ft.	6.49 lb.	145 ft.	62.81 lb.	275 ft.	119.12 lb.
20 ft.	8.66 lb.	150 ft.	64.97 lb.	280 ft.	121.29 lb.
25 ft.	10.82 lb.	155 ft.	67.14 lb.	285 ft.	123.45 lb.
30 ft.	12.99 lb.	160 ft.	69.31 lb.	290 ft.	125.62 lb.
35 ft.	15.16 lb.	165 ft.	71.47 lb.	295 ft.	127.78 lb.
40 ft.	17.32 lb.	170 ft.	73.64 lb.	300 ft.	129.95 lb.
45 ft.	19.49 lb.	175 ft.	75.80 lb.	310 ft.	134.28 lb.
50 ft.	21.65 lb.	180 ft.	77.97 lb.	320 ft.	138.62 lb.
55 ft.	23.82 lb.	185 ft.	80.14 lb.	330 ft.	142.95 lb.
60 ft.	25.99 lb.	190 ft.	82.30 lb.	340 ft.	147.28 lb.
65 ft.	28.15 lb.	195 ft.	84.47 lb.	350 ft.	151.61 lb.
70 ft.	30.32 lb.	200 ft.	86.63 lb.	360 ft.	155.94 lb.
75 ft.	32.48 lb.	205 ft.	88.80 lb.	370 ft.	160.27 lb.
80 ft.	34.65 lb.	210 ft.	90.96 lb.	380 ft.	164.61 lb.
85 ft.	36.82 lb.	215 ft.	93.14 lb.	390 ft.	168.94 lb.
90 ft.	38.98 lb.	220 ft.	95.30 lb.	400 ft.	173.27 lb.
95 ft.	41.15 lb.	225 ft.	97.49 lb.	500 ft.	216.58 lb.
100 ft.	43.31 lb.	230 ft.	99.63 lb.	600 ft.	259.90 lb.
105 ft.	45.48 lb.	235 ft.	101.79 lb.	700 ft.	303.22 lb.
110 ft.	47.64 lb.	240 ft.	103.96 lb.	800 ft.	346.54 lb.
115 ft.	49.81 lb.	245 ft.	106.13 lb.	900 ft.	389.86 lb.
120 ft.	51.98 lb.	250 ft.	108.29 lb.	1000 ft.	433.18 lb.
125 ft.	54.15 lb.	255 ft.	110.46 lb.		

The drawing shows a fine understanding of plumbing and of isometric drawing. About the only thing we have to criticize is the location of some of the fixtures. For instance, the line of five water closets at the center of the second floor is further from the right hand end of the building by quite a little than the line of four lavatories in the men's toilet room on the first floor. In the elevation, however, as we figure it, this situation is reversed.

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(S. I. W)

Soil Pipe and Fittings

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For

Permanency

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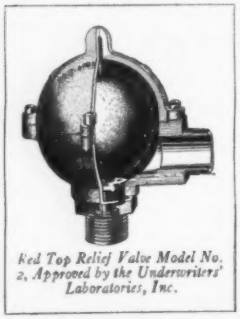
Many years ago, a falling apple bounced off the cranium of Sir Isaac Newton. Promptly the scientist called for his stenog and dictated to her the law of gravity.

Taking a tip from Sir Isaac, the designer of Red Top Relief Valves made good use of the gravity principle. A simple sure-operating valve was the result, a valve automatically opened by pressure in the system, and automatically closed by gravity when adequate relief is given.



Red Top Relief Valve Model No. 2, Approved by the Underwriters' Laboratories, Inc.

So positive is its action that the Red Top Relief Valve bears the official approval of America's foremost testing organization, the Underwriters' Laboratories, Inc., as well as State and Municipal Boards of Water and Boiler Inspection.

Send for descriptive folder.

Neptune Meter Company
50 E. 42nd St. New York City, N. Y.
Branch Offices in Principal Cities

Red Top Relief Valves

It will be clear that this throws the elevation out of true, even though the actual connections themselves may be correct in principle. The ratio between the width and length of the building as shown in the elevation seems to be the same as this ratio taken from the original floor plans, but the mistake evidently comes from wrong measurements in getting fixture locations.

American Plumbing Goods Abroad

(Continued from Page 35)

WEST INDIAN MARKETS

THE MARKETS of the West Indies, excepting those of Cuba which have been described, though they are quite similar, have certain differences which would affect the sale of plumbing. First, in common with Central America and the rest of the large market-area discussed in this article, only certain fixtures are in demand and the sale of the others is directly affected by the backwardness of the masses of the population. An indication of the prevailing conditions is to be found in the fact that plumbing fixtures are more frequently obtained on order from the United States than from stocks in the hands of local dealers.

Bathing facilities more frequently consist of some form of shower bath, often homemade, though fairly large numbers of leg-equipped tubs are sold in Bermuda and lesser numbers in the Dominican Republic. In Haiti, however, the tub gives way to the "bassin," a tiled tank averaging 6 by 10 by 3 feet in size. Bidets find only a very limited use.

Toilet facilities are usually provided within the urban houses and vitreous china or porcelain bowls, low tanks or high, depending upon the water supply, and wooden seats complete the installation. It is customary, however, to import the bowl and tank only, the seat being manufactured of local woods which are by nature better able to withstand the ravages of the hot and humid climate and the ants. In Haiti and the Dominican Republic, outhouses or wells and tanks located within the patios or yards of the dwellings are usually the only toilet facilities provided. The generally primitive nature of the sanitary arrangements also reacts against the extensive use of urinals, which are to be found only in a few of the better and more recently erected public and semi-public structures.

Throughout the British West Indies, and especially in Jamaica and Bermuda, kitchen sinks enjoy fairly wide use, but in the Dominican Republic and Haiti but few are installed owing to the rather general absence of running water. Laundry trays are almost unknown as there is no need to install them in the homes of the better classes from which all laundry work is sent out to the homes of the poorer classes which, in turn, cannot afford them. Lavatories, however, enjoy somewhat more extensive use and the number of these fixtures in use is approximately as great as in the case of kitchen sinks, with perhaps a few more in use in the island republics of Haiti and the Dominican Republic.

For obvious reasons water heaters are practically unknown throughout the West Indies. Bathroom accessories, likewise, enjoy only a very limited distribution. Faucets, valves, and other exposed fittings are usually nickeled except in Haiti, where the preference is for the plain brass faucet. The American pipe thread is the most widely used, although in some of the British islands the Whitworth thread is employed.

CENTRAL AMERICAN PREFERENCES

CONDITIONS in Central America rather closely resemble those of the West Indies, if we except those sections of Panama where large numbers of Americans reside. The preferences of the various areas, too, are quite similar to those of the neighboring islands and the employment of American fixtures in the area, as a whole, is quite on a parity with their use in the West Indies.

Here again, bathtubs are virtually dispensed with in favor of some form of shower bath—the simple expedient of using a bucket and dipper probably being more frequent than elsewhere. Where tubs are installed, the preference seems divided between enameled and porcelain fixtures, with the latter having perhaps a little the better of the market. The demand for bidets is negligible throughout most of the area, though greater numbers of these fixtures are being used in Panama.

Throughout all of the area in most of the cities and towns, outhouses are prohibited, and, as a result, closets are usually installed within the houses. Both porcelain and enameled iron bowls are used and usually low tanks are preferred, although there are numbers of high tanks in some sections. Water supplies, however, are usually rather uncertain, so it is quite customary to install storage tanks on the roofs of the prevailing one-story dwellings to hold water for use in flushing these fixtures during periods of shortage. The demand for and installation of urinals is quite limited.

The uncertainty of the water supply noted above is not especially detrimental to the use of kitchen sinks, however, and the installation of these fixtures is quite general except in Salvador, where a reservoir called a "pila" is used to hold the water in which the dishes are washed. Laundry trays are virtually unknown except in Panama, where resident Americans sometimes have them installed. Enameled iron lavatories enjoy fairly extensive use throughout the whole of the area wherever running water is available, though they lack the great popularity they enjoy in Mexico.

Bathroom accessories are rather more widely used in Central America than in the West Indies, but at best their use is not very extensive and is confined almost entirely to the more familiar and cheaper fixtures. Water heaters, both on account of the climate and because of the general lack of gas, find little use. The American pipe thread is almost universally employed.

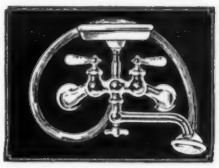
The Equalizing Pipe

(Continued from Page 50)

is found in the system. This vacuum may amount to as much as fifteen to twenty inches in the radiators. The vacuum pump has already shut off at ten inches of vacuum. With a higher vacuum in the radiators than at the pump, circulation stops and the condensation remains in the radiation and cannot get back to the pump receiver, so the float switch remains out of operation. This condition may reach the point where the boiler may be endangered by low water.

When the contractor has encountered this situation in the past, many different remedies have been tried. Possibly the most well-known plan is that of inserting a vacuum breaker in the boiler header, or placing a fixed leak in the return line at the most distant point from the pump. Both of these plans, however, are simply makeshifts, as air admitted to a system through a vacuum breaker or fixed leak must afterwards be pumped out again at the expense of wear and tear on the pump and excessive power costs.

Classic Sink Fixture



Father of all the other combination sink fixtures and far and away the biggest seller of the lot. You'll make no mistake to keep on selling Classics, no matter how many substitutes come hammering at your door.

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R. LAVIN & SONS
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LOW PRESSURE AEROFIN 2 to 50 lbs. gauge steam Tube-Plate Construction

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Encased Units, installed quickly and cheaply

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25 to 350 lbs. gauge steam Continuous Seamless Tubes HIGH PRESSURE AEROFIN

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Quadruple coils of copper and the patented Kerogas Burner (Hotstream is the only Water Heater licensed to use it) insure the greatest efficiency.

Lights instantly at the touch of a match—is noiseless, sootless and extremely economical.

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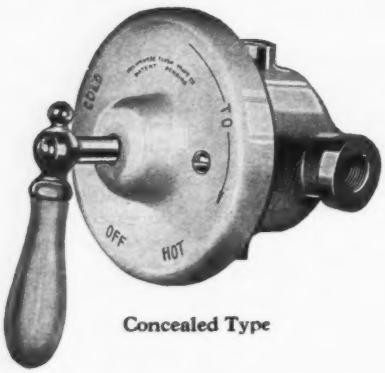

Concealed Type

ANOTHER JUDELL PRODUCT

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As its name indicates, the "Improved" Milwaukee is a BETTER mixer, more accessible,

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—the ultimate in simplicity. High grade red brass castings, all working parts renewable, no binding, positive closure, making this mixing valve

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For a complete line of concealed showers and fixtures, ask for our new catalog "F"

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Manufactured by
Milwaukee Flush Valve Co.
Milwaukee, Wis., U. S. A.

During the last few years a more practical and better method has been designed for equalizing or balancing the induced vacuum on the radiation with that at the pump. This is accomplished in the following manner: The receiving tank of the vacuum pump is tapped in the top with a 1-inch or 1½-inch pipe tap. A pipe line is then run to a U-bend just above the steam main and then to the top of the main. A check valve is inserted in the bottom of the U-bend, opening towards the main (See Fig. 2). The check valve remains closed as long as the pressure on the main is above that at the pump. The check opens as soon as a vacuum is produced in the main, which is greater than the vacuum at the pump. The U-bend is made in the pipe to seal the check valve.

With this equalizing pipe inserted in the system, the equipment functions as a straight vacuum system as long as there is a pressure on the steam main, both controls on the pump serving their intended purpose.

When an induced vacuum is produced, the vacuum control goes out of service, but the vacuum at the pump is equal to that on the steam main so the condensation flows to the pump tank, starts the float switch, and the water is returned to the boiler. Should the steam pressure rise again, due to the increased firing of the boiler, the check valve again closes and the system is back on a regular vacuum basis again.

The writer has used this method in a number of cases and has never failed to cure trouble caused by induced or condensation vacuum. It is far superior to the vacuum breaker method, because no spring adjustment is necessary. In fact, the human element does not enter the problem at all.

Using an Oil Burning Steam Boiler in a Summer and Winter Combination

(Continued from Page 47)

steam supply leading to the radiation must be closed off during the summer.

The operation is as follows: The oil burner generates slight steam pressure in the boiler. This is controlled by the pressure control starting and stopping the motor to maintain this pressure. Both the live steam and the water in the boiler heat the water in the storage tank through the semi-indirect heater. When the heater in the storage tank reaches the desired temperature the temperature control will stop the oil burner independently of the pressure control. Likewise, the pressure control will stop the burner independently of the temperature control, thus preventing either excessive steam pressure or excessive water temperature.

A single pole knife switch is inserted across the line leading to the temperature control. This switch must be closed during winter as no control will be required on a storage tank during the winter months.

TO HOLD ANNUAL LADIES' NIGHT

The annual ladies' night of the North Hudson Master Plumbers' Association will be held at the Elks Club House, Union City, N. J., January 9, it is announced by Secretary Clyde C. Cole. The affair will begin at 8 p. m. The regular entertainment committee, headed by Chairman Alex Thane and including Secretary Cole, A. C. Krieger, E. A. Seitz, J. Syfel, William F. Borg, William T. J. Orris, Charles Stellar, and Charles Zimmerman, is in charge of arrangements.

Markets

(Continued from Page 60)

cepted by makers for shipment at their own convenience, consequently quite substantial releases are reported. Jobbers' stocks, in most instances, are in excess of what present consumption requires. Deliveries may be had on short notice. Prices are unchanged.

Boilers and Radiators

According to some makers, demand has diminished sharply since the first of the month but activities on the whole are in keeping with the season and are comparable with those prevailing in the corresponding period of previous years. Factories have ample reserves on hand, and no delivery extensions are heard of. Prices being quoted are still variable but no changes have been announced.

PACIFIC COAST

Buying Movement Is Light—

Business on the Coast is experiencing the usual December lull with practically everyone withholding purchasing material until after the first of the year. From the amount of work on architect's boards, the indications are that business during the first quarter of 1928 should be in good volume. Price conditions vary in the different jobbing centers. However, prices as a whole are more firm than they have been for the past few months.

Soil Pipe

The trade is only purchasing such tonnage as is required for immediate installation and jobbers show no disposition to purchase heavy in this commodity. Jobbers' stocks, considering the approaching inventories, are in rather good shape and practically all of the trade's requirements can be taken care of without delay. Jobbers' prices to the trade, while varying in the different jobbing centers, remain unchanged.

Steel Pipe

This commodity is moving at a moderate rate with most of the purchasing being in small lots for immediate requirements. There are many different stocks of pipe on the Coast, all of which are in rather good shape, and the trades's requirements can be filled without difficulty. Jobbers' prices to the trade remain unchanged.

Enameled Ware

The demand for enameled ware is being maintained at a fairly satisfactory pace and very little if any change is expected within the near future. Manufacturers and manufacturers' warehouses are carrying the bulk of stock on the Coast and the jobbers as a rule are carrying only small stocks and depending upon these sources for ware as sold. During the week most of the manufacturers announced a definite decline in the price of this commodity which most jobbers have already reflected in their prices to the trade.

Pottery

Week to week demand for this commodity shows very little change and the amount of ware being used at present is about normal for this period of the year. Distributors' stocks are at a minimum although sufficient to take care of the trade's immediate wants, and prompt replacement can be obtained from the various potteries and warehouses. Jobbers' prices to the trade remain unchanged.

Plumbers' Brass Goods

The demand for this commodity is manifesting its lasting qualities and seems to continue irrespective of what the demand for other materials may be. Distributors are carrying only sufficient stocks to take care of the trade's

Watrous

Patent Plumbing Fixtures and Duojet Water Closets

A LINE representing the most advanced ideas in sanitation. Economy of operation and ease of installation. Duojet Closets—Flush Valves—Self-Closing Basin Cocks—Combination Lavatory Fixtures—Pop-Up Wastes—Liquid Soap Fixtures, etc.

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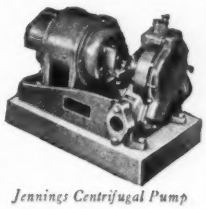
JENNINGS Centrifugal Pumps are supplied for (a) circulating hot and cold water in apartment houses, hotels, hospitals, etc., (b) boosting water pressure to supply top stories in tall and even moderately high buildings, (c) promoting circulation in pressure hot water heating systems, (d) circulating water to and from swimming pools.
Capacities up to 1000 g. p. m. and pressures up to and exceeding 100 lbs.

Write for Bulletin No. 52



Jennings Centrifugal Pump

NASH ENGINEERING CO.
41 Wilson Rd., So. Norwalk, Conn.

Jennings Pumps

The PORCELIRON Laundry Tray

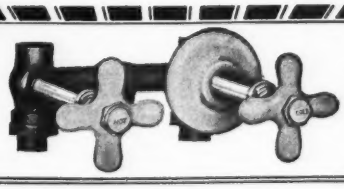
PORCELIRON

Easily Installed—No Corners—Durable—Sanitary—Moderate in Price.

Write for Booklet

INGRAM-RICHARDSON MANUFACTURING CO.
BEAVER FALLS, PENNA

Porceliron Factories at
Beaver Falls, Pa., Frankfort, Ind., Bayonne, N. J.



The Hudson Concealed Shower Body Features

1—*red brass* made from ingot melted electrically
2—tested against 150 lbs. water pressure
3—china adjustable flanges with N. P. shanks
4—non-cemented china handle screwed rigidly by china-index button
5—by-pass connections and union couplings

HUDSON BRASS WORKS, INC., BROOKLYN, N.Y.

THE LAST WORD!

RATHBUN MODEL "S"

NO YEARLY MODELS BUT ALWAYS AHEAD

PIONEER MANUFACTURERS OF VERTICAL PORTABLE ELECTRIC PUMPS.

AFTER you have found out all there is to know about this quality pump, your next move will be to go out and get the business that is waiting for you.

Ask your jobber.

The Rathbun Co.
4045 Beaufait St., Detroit, Mich.

You Can Pay More—If You Want to—

But you won't get better materials or workmanship than you do in the Enterprise Ball Cock.

Enterprise is furnished with ⅝ or ¾ shank and high pressure compound lever.

It is necessary to remove only one thumb screw to take plunger out and replace seat discs.

From Your Jobber

ENTERPRISE BRASS WORKS
Muskegon, Michigan

Our Catalog is

EBW

immediate requirements and replacing their merchandise in the same quantity as sold. Price conditions are the same as they were in the earlier part of the year, no changes having been announced.

Range Boilers

A steady though not large demand continues for this commodity. Fluctuations in prices do not seem to either stimulate or depress demand and merchandise is being bought only for actual requirements. Distributors have sufficient stocks to take care of current demands and can also obtain early replacement of all merchandise from the factories. Prices in most of the jobbing centers on the Coast are based on present replacement cost and remain unchanged.

OSCAR H. DITTMER CALLED BY DEATH

Oscar H. Dittmer, president of the Dittmer Plumbing & Gas Fitting Co., Milwaukee, Wis., died suddenly Wednesday evening, December 14, at his office, 1403 Fond du Lac avenue, following a heart attack. He was in his 67th year. Mr. Dittmer is well known in local and state plumbing circles, having been in the plumbing business in Milwaukee for 35 years.

He is survived by his wife and two children, Norbert L. and Joy E. Dittmer. He was a member of Damon lodge No. 102, Knights of Pythias, Excelsior lodge No. 175, F. and A. M. and Gallilee Commandery No. 38 and the Sons of Veterans.

PITTSBURGH APPRENTICES TEMPORARILY ATTEND CARNEGIE

The Grant Street school, Pittsburgh, Pa., was recently destroyed by fire. It was in this building that the Pittsburgh apprentice school was housed, and it is now impossible for that school to continue in the building. The Carnegie Institute of Technology, through its department of plumbing and heating, of which Samuel E. Dibble is the head, offered the board of education the use of part of its plumbing and heating shop until the board can find room for the students.

At present the apprentices are attending classes at the institute with the same instructors they had at the Grant Street school.

PACIFIC OIL BURNER ASSOCIATION ENTERTAINS NATIONAL SECRETARY

L. D. Becker, of New York, executive secretary of the American Oil Burner Association, and an official of the Oil Heating Institute, was the guest of honor at a dinner at the Elks Club, San Francisco, Calif., November 23. The dinner was given by local oil burner manufacturers under the auspices of the Pacific Oil Burner Association, at which time Mr. Becker outlined the work accomplished by the institute and its educational program.

H. K. KRIEBEL CALLED BY DEATH

H. K. Kriebel, who died in Philadelphia on December 2, was one of the pioneers in the heating business in that city. He had spent approximately a half century in various departments of the industry, learning his trade about 50 years ago. In 1882, he first went into the manufacturing end of the business, boilers and heating materials being the division in which he was interested. Continuous participation in trade affairs led to his last invention, the Kriebel system of vapor vacuum heating, which he announced in 1907. In addition to his manufacturing interests, Mr. Kriebel was a heating engineer, and served in that capacity on many of the larger buildings in the Philadelphia area, being widely known for his designs. He was an active member of the Master Steam Fitters Association for many years.

THIS WEEK

AMONG MANUFACTURERS, WHOLESALERS AND THEIR SALESMEN

LAIB CO. BUYS J. L. MOTT CO.

A merger of the Laib Co. and the Columbia Sanitary Mfg. Co., both of Louisville, Ky., and the J. L. Mott Co., of Trenton, N. J., is announced, subject to the approval of the United States District Court, southern district of New Jersey. The announcement followed the purchase of the J. L. Mott Co. by a reorganization committee at a sale to end a receivership, held in Trenton on December 14. C. H. Baker, one of the receivers, accepted the offer, made through the Guaranty Trust Co., of New York City, of $1,656,000 for the plant, property, good will, and accounts receivable, the bid also being accepted by Special Master McPherson.

The consolidation will include, in addition to the three parent companies, seven subsidiary concerns, including the J. L. Mott Iron Works, the Trenton Fire Clay and Porcelain Co., Mott Company of Pennsylvania, Mott Southern Co. of Atlanta, and the Mott Company, Ltd., of Montreal, all of these being Mott branches, the Nashville Plumbing and Heating Supply Co., Nashville, Tenn., and the Huron Plumbing Supply Co., Toledo, Ohio, both Laib subsidiaries.

It was stated that the consolidation was brought about by James W. Johnson, consulting engineer, being negotiated by G. H. Laib, president of the Laib Co., and W. G. Probst, vice-president of the Columbia Sanitary Mfg. Co. Mr. Laib stated that his company is eager to start operations at once and to take over approximately $1,500,000 in unfilled orders. This is of course contingent upon the approval of the sale by the court. Election of officers also will have to wait until this approval is given.

The Mott company is one of the oldest in the field, and was a leading force for many years in the plumbing and heating fields. There are now approximately 1,200 workmen employed at the plant.

NEW SUPPLY HOUSE TO OPEN IN CHICAGO

George B. Baldwin, formerly vice president in charge of sales of the Stockham Pipe & Fittings Co., Birmingham, Ala., resigned recently from that position, and has established Geo. B. Baldwin & Co. The new company will begin operations as a wholesaler of plumbing and heating materials about January 1. It will be located at 5753-5 Ogden avenue, Cicero, Ill.

CHANGES ADDRESS IN DETROIT

The Rathbun Co., manufacturers of pumps in Detroit, Mich., has changed its address, and is now located at 4045 Beaufait street in that city.

THERMOVALVE CO. IS ORGANIZED IN CLEVELAND

The Thermovalve Co., 2015 East Sixty-fifth street, Cleveland, Ohio, has been incorporated for the purpose of manufacturing built-in bath fixtures and positive temperature control valves for showers, baths and lavatories. Distribution will be made through plumbing supply wholesalers, according to the organizers of the company. Both the offices and the factory are located at the above address.

E. M. Rogert is president and treasurer of the new company and G. Schumacher is vice president and secretary. For the past five years Mr. Rogert was general manager of the United Brass Mfg. Co. and recently resigned as president of the United-Oberndorf Corp., Cleveland, Ohio, to organize the new company. Mr. Schumacher was formerly western district sales manager of the United Brass Mfg. Co.

CLEVELAND COMPANIES MERGE INTERESTS

E. H. Blywise

The Grabler Manufacturing Company, Cleveland, Ohio, manufacturer of plumbing and heating specialties, and the Republic Brass Company, also of Cleveland, have merged their interests. The distribution of Grabler company products and Republic company brass goods will be handled by a subsidiary of the Grabler and Republic companies under the name of Grabler-Republic, Inc., and under the personal supervision of E. H. Blywise, who is well known throughout the plumbing industry.

BRIDGEPORT BRASS CO. OPENS BOSTON OFFICE

The Bridgeport Brass Co. Bridgeport, Conn., has established a branch office in Boston. Up until recently the company was able to give good delivery service throughout New England, but, with an increase in business, it was found necessary to establish the Boston office for speedier service. The office is located in Room 1060, Park Square building, in the Back Bay district.

William J. Hawkins, who has been handling the company's products in Boston, will be in charge of the office. He has been connected with the company for the past twenty years, in various capacities, and is well known to the trade in and around Boston.

F. E. MYERS & BRO. CO. REORGANIZED

At a recent meeting of the stockholders of the F. E. Myers & Bro. Co., manufacturer of pumps at Ashland, Ohio, action was taken to authorize the sale and transfer of all property and assets of the existing corporation to a new corporation organized under the same name. With this reorganization comes the announcement that it is the intention of the management to list the common and preferred stock of the company on the Cleveland Stock Exchange and to permit public participation for the first time.

The new company will have an authorized capital stock of $3,000,000 in 6 per cent cumulative preferred stock, and 200,000 shares of no par value common stock. The management of the company will remain the same, with

the addition of two new directors. Officers elected at the stockholders' meeting are: P. A. Myers, president; John C. Myers, first vice president; Guy C. Myers, second vice president; A. N. Myers, third vice president; G. D. Myers, fourth vice president; F. B. Kellogg, secretary and treasurer. The directors, in addition to the officers, are T. W. Miller of Ashland, J. R. Nutt and L. B. Williams of Cleveland, Ohio.

OPENS SHOWROOM IN PATERSON

The American Radiator Co., New York City, has recently opened another public showroom, the latest being at 301 Main street, Paterson, N. J. Heating contractor customers of the company are asked to use this at any time they wish to show products manufactured by the company to their prospective buyers. Correspondence and inquiries pertaining to orders should continue to be sent to the manufacturers' headquarters at 40 West Fortieth street, New York City.

CHANGES NAME TO GORTON HEATING CORP.

Effective immediately, the name of the Gorton & Lidgerwood Co., New York City, has been changed to the Gorton Heating Corp. This change does not affect the business in any way, the management and personnel remaining the same. The general offices of the company will remain at 96 Liberty street.

REPRESENTS DOLE VALVE CO. IN DETROIT

The Dole Valve Co., 1923 Carroll avenue, Chicago, is represented in Detroit, Mich., by Gay Hall, formerly of the Westinghouse Electric & Mfg. Co., and I. S. Lutz. The new address of the Detroit branch is 3-247 General Motors building.

ENLARGES MINNEAPOLIS BRANCH

The Grinnell Co., Inc., Providence, R. I., is enlarging its quarters in the Minneapolis branch. The whole building located at 240 Seventh avenue, South, has been taken over, and will give 38,000 square feet of floor space.

The new offices will be maintained on the second floor in the front of the building, and in addition equipment is being added in the shop, which gives facilities for handling pipe up to 12 inches. This will enable the company to give better service on sprinkler and heating work in this locality. The branch is under the supervision of T. T. Cash.

APPOINTED DISTRIBUTORS FOR TWO COUNTIES

Haff Supply Co., Inc., Amityville, Long Island, N. Y., is now erecting a new building, 80x40 ft., as an addition to its plant for the distribution of plumbers' and tinsmiths' supplies. The new building was made necessary by the fact that the company has been appointed sole distributor for Suffolk and Nassau Counties for the International Heater Co., Utica, N. Y. The line made by this company will be stocked in the new building, which will give the wholesalers a stock of 18,300 ft. of floor space. L. M. Edwards, International Heater Co. representative, will continue to call on the Long Island trade. All deliveries in the future will be made from Amityville.

BUYS INTEREST IN STEAM SPECIALTY COMPANY

The interests of R. H. Hobbie in the Kitts Steam Specialty Co., 56 East Second street, Oswego, N. Y., have been sold to Thomas J. Fitzsimmons, for many years connected with the concern. The business will be carried on under the same name, but with a new company made up of the following officers: president, Thomas J. Fitzsimmons; vice president, M. A. Skelley; secretary and treasurer, I. C. Fitzsimmons. The company will continue to make steam traps, steam valves, damper regulators, boiler feeders and steam specialties of all kinds. Later a new plant will be built on property recently acquired for the purpose.

APPOINTS NEW REPRESENTATIVES

The Taber Pump Co., Buffalo, N. Y., has just appointed two new representatives. One representative is Frank F. Glenn & Co., which will represent the company in Philadelphia, Pa., Washington, D. C., and Baltimore, Md. The other is J. A. McAuliffe & Co., 214 Old South building, Boston, who will sell the company's products in that territory.

HOLDS ANNUAL SALES CONFERENCE

The M. S. Little Mfg. Co., Hartford, Conn., held a sales meeting at the company's plant December 19 and 20. M. S. Little, president of the company, was in charge of the meeting, which was attended by a large number of the company's representatives.

T. E. B. COMMITTEE ISSUES BOOKLET

The program and budget committee of the National Trade Extension Bureau, Evansville, Ind., has just issued a booklet outlining the enlarged program of the plumbing and heating industry for 1928. The first paragraph points out that "the bureau has inspired confidence through the valuable work it has done and has so well justified itself that, with the financial and moral support of the various factors in the industries concerned, including retailers, wholesalers and manufacturers, it is entering upon an enlarged and intensified program. The essential features of that program are set forth in this booklet."

In speaking of the aims of the bureau, the booklet explains that, as a group, members of the plumbing and heating industry are in competition with other industries who are getting business from the public, leaving less purchasing power for plumbing and heating goods. "To meet this competition, we, too, must maintain, through organized co-operation, a central agency which will secure the market information we need, carry on educational work for the purpose of promoting high standards of craftsmanship and sound business methods in our own ranks, and provide advertising and sales help to the trade. The bureau provides us that agency," the booklet states. It further points out that a chief aim of the bureau is to stimulate a keener public consciousness of the importance of plumbing and heating. In doing this, the bureau is co-operating with civic bodies, trade associations, building associations and women's clubs, according to the booklet.

In analyzing the work of the bureau, five principal efforts are outlined. They are: Collect and spread plumbing and heating knowledge; give advertising and sales help to the trade; give accounting service; promote higher standards of craftsmanship; a list of general activities. Under the heading of "Bureau Co-operation with the Various Factors in Our Industries," it is pointed out how the work of the bureau helps the different branches of the industry. These include the master plumber and heating contractor, associations of master plumbers and heating contractors, wholesalers, manufacturers, trade associations and the trade press. The results to each of these factors are also given.

In closing, the booklet looks to the future of the industry, and what the enlarged program will do for it. In closing it states, "Broadly, the work of the bureau is education, and education means effort, intense and concentrated effort, and watchful alertness. No constructive campaign of education can succeed if undertaken by hit

At the California Sanitation Development League tournament at Crystal Springs course. Top picture, left to right: Bruce Cruickshank, F. H. Stackpoole, Curtis Gilley and John Young. —Bottom picture: Robert Allman, Thomas Douglas, William Durkee and John McLeod

or miss methods, or if pushed only occasionally." Some hint of the type of advertising to be used by the bureau in its campaign is also contained in the concluding paragraphs which discuss the beneficial influence on business of a greater public appreciation of modern plumbing and heating conveniences.

This booklet was prepared by the publicity committee of the program and budget committee. This publicity committee is composed of: W. K. Glen, chairman; C. B. Nash, L. L. Smith, Louis Bruch, Russell G. Creviston. The program and budget committee is made up of the following members: Walter J. Kohler, chairman,; Russell G. Creviston, secretary; H. W. Seymour, C. K. Foster, W. J. Woolley, A. M. Maddock, J. W. Oliver, Henry E. Longley, W. C. Chamberlin, Louis Bruch, V. L. Sheldon and George F. Reeke.

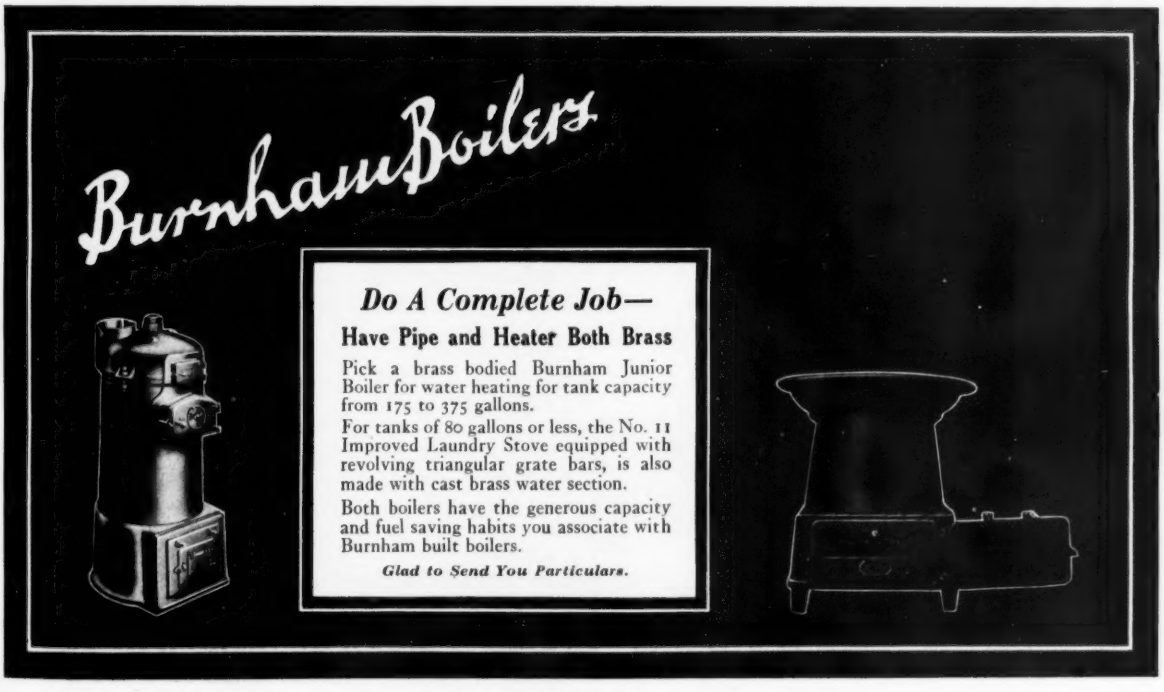
GOLFERS CARRY ON IN CALIFORNIA

Ideal weather and an ideal course combined to make an ideal day of it for the golf section of the California Sanitation Development League when it met at the Crystal Springs course for its monthly tournament play, December 8.

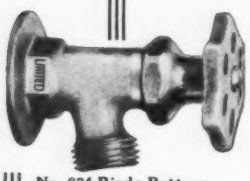
Driving down the Peninsula and into the green hills back of Burlingame, close to thirty members gathered at the Crystal Springs Country Club for luncheon. By 1:30, six foursomes had teed off for what turned out to be one of the most enjoyable events ever scheduled on the league calendar.

When the last foursome turned in their cards it developed that H. Porter Wilson had made off with the low gross, 88, William Rowe capturing the low net honors with a 68 tally. The complete score follows:

	Gro.	Hdp.	Net
Dalziel	95	14	81
Forsyth (Guest)	118	..	118
Leary	101	24	77
Rowe	96	28	68
Allmon	97	19	78
Douglas	97	18	79
Durkee	108	35	73
McLeod	110	35	75
Johnston (Guest)	112	..	112
Lees	94	18	76
Morse (Guest)	97	..	97
White	100	20	80
Heymans	111	30	81
Lamond	96	20	76
Taylor (Guest)	95	..	95
Wilson	88	21	67
Cruickshank	93	23	70
Gilley	96	25	71
Stackpoole (Guest)	110	..	110
Young	93	20	73
Ellery (Guest)	111	..	111
Johnson (Guest)	102	..	102
Ruegg (Guest)	103	..	103
Sweetman (Guest)	103	..	103


Burnham Boilers
Do A Complete Job—
Have Pipe and Heater Both Brass
Pick a brass bodied Burnham Junior Boiler for water heating for tank capacity from 175 to 375 gallons.
For tanks of 80 gallons or less, the No. 11 Improved Laundry Stove equipped with revolving triangular grate bars, is also made with cast brass water section.
Both boilers have the generous capacity and fuel saving habits you associate with Burnham built boilers.
Glad to Send You Particulars.

Burnham Boiler Corporation
Irvington, New York
Representatives in All Principal Cities of the U. S. and Canada



No. 824 Birdo Pattern

Lawn Faucet, Combination Wheel Key

One of the complete line of United Bath and Shower Fixtures; staple Plumbing, Tubular Brass and water works Brass Goods. Can be furnished with loose key, wheel handle or combination wheel key.

United-Oberndorf Corp.
3841 Hamilton Ave.
CLEVELAND OHIO

UNITED

INBRACO

INDIANA PRODUCTS
For Quality

This Double Acting Lever, our No. 25, will meet every demand required of a superior product. They have more than proven themselves on the job

INDIANA BRASS CO.
Frankfort, Indiana

LEADING CORPORATIONS—distinguished for the certainty with which they buy the most modern equipment and secure the most satisfactory service at lowest final cost—are installing Heggie-Simplex Electric Welded Steel heating boilers in steadily increasing numbers.

HEGGIE-SIMPLEX BOILER COMPANY
JOLIET, ILLINOIS
Representatives in Principal Cities

KENNEDY
VALVES-PIPE FITTINGS-FIRE HYDRANTS

GATE VALVES

low-pressure, standard, heavy, and extra-heavy, all types and sizes.

Send for catalog

The Kennedy Valve Mfg. Co.
Elmira, N. Y.
Branches in principal cities

After playing the nineteenth hole the league golfers sat down at the long banquet table tastefully decorated with red Toyon berry sprigs and spread before the blazing fireplace. A most delicious dinner was served, in which fried chicken figured conspicuously.

Curtis Gilley, president of the California Sanitation Development League, presided as chairman, and appointed Thomas F. Leary as sergeant-at-arms.

A brief discussion as to where the next tournament might be held ensued. This led up to an announcement by Norman W. Farlow, who has been handling the league's golf activities since its inception.

What Mr. Farlow proposed was the organization of a California State Golf Trades Association. "From those few with whom I have talked over this matter here in the San Francisco Bay district, in the San Joaquin and Sacramento Valleys, and in Southern California, I have reason to think that this idea will take hold and prove a popular one," he said. Indicating some measure of the splendid results achieved through the medium of golf among the members of the league, Mr. Farlow voiced the opinion that the same results might be looked for in other parts of the state. In addition to this, he said that the added attraction of an annual or semi-annual tournament participated in by men from all over the state, at some central point such as Del Monte, would undoubtedly mean much to the industry as a whole and to each man as an individual.

Opinions were called for from every man present, when it developed that sentiment was in favor of the project. While as yet no active organization efforts have been put forth in this direction, the idea of a state-wide trade golf association is being given a great deal of serious thought.

Personal Mention

F. M. Brooks, Jr., has been appointed sales manager for the Central Radiator Co., and the Molby Boiler Co., with offices at the company's headquarters in the Graybar building, New York City. Mr. Brooks is well known to the heating trade in the East, having been connected with the Abram Cox Co., Philadelphia, since 1919, his most recent position with that concern being sales manager of its New York City office.

J. L. Stulsaft, manager of the New York office of The M. S. Little Mfg. Co., Hartford, Conn., is on a combination business and pleasure trip to the West Indies and Cuba. Mr. Stulsaft plans to return during the second week in January.

James J. Mason, formerly associated with the Herman Nelson Corp. and the Utica Heater Co., has been appointed architectural and engineering representative of the National Radiator Corp. in the Cleveland, Ohio, territory.

Ross Clark, manager of the San Francisco branch of the American Radiator Co., left December 7 for New York to attend the conference of branch managers held at the home office every year at this time. Mr. Clark expected to return to the West Coast by Christmas.

John S. Webb, formerly a member of the firm of Wiley & Calhoun, heating contractors of Portland, Me., recently severed his connection with that concern and is now representing the Herman Nelson Corp. of Moline, Ill., in New England. Mr. Webb covers all of New England with the exception of the state of Maine.

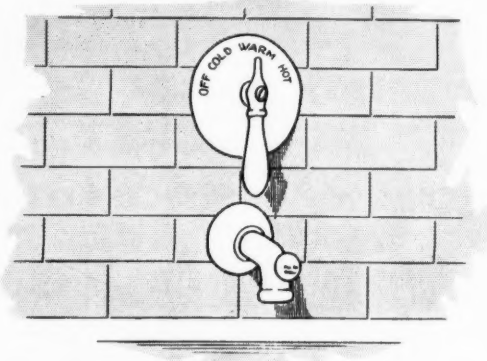
Joseph Silverman, formerly connected with the Pittsburg Water Heater Co., Pittsburgh, Pa., has recently joined the sales force of the Jepco Mfg. Co., Boston, Mass., and will work in Boston proper.

New Equipment

A New "Diverting" Faucet

Manufacturers of plumbing devices continue to exercise their ingenuity to add beauty, convenience and safety to American bathroom equipment, which is now renowned throughout the world for these characteristics. One of the new ideas along this line is a faucet of simple construction. It is called a diverting faucet for one of its chief functions is to divert water from the tub to the shower when a button is pulled. It is used in connection with a mixing valve.

Under all conditions, when the water is turned on first, it is discharged through the bathtub faucet. When preparing for a shower, the user naturally holds his hand under the discharging water in order to regulate the temperature by manipulation of the mixing valve. This is believed by the manufacturers to be more convenient than holding the hand under the shower. When the temperature is right, a china button is pulled forward. The button is mounted on the front of the bathtub faucet. On pulling the button, the water immediately ceases to flow through the bathtub faucet and is diverted to the shower head. The pressure of the water keeps the button in the "out" position so long as the shower is in operation.



When the shower bath is completed and the water is turned off the china button automatically springs back into its original position so that, when the water is turned on again, it will go into the tub. Another object is to prevent the possibility of the bather being sprinkled by the shower before he is ready.

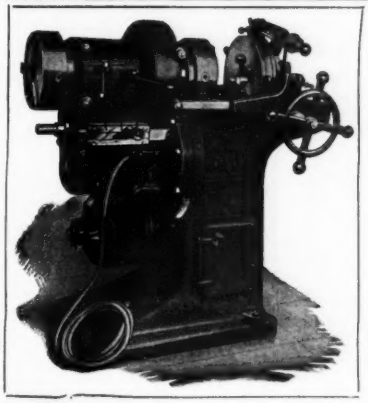
New Trade Literature

"Cork and Insulation"

A book consisting of eighty-four pages, 8½ by 10¾ inches, printed on highly glazed paper, has just been issued by United Cork Companies, of New York City. The book contains information on the subject of methods of insulation, and describes the procedure in obtaining cork from the cork oak of southern Europe and Africa. The method of manufacture of cork board insulation and its uses in various industries is described. A section of fifty pages is devoted to blue prints and specifications for insulation for walls, floors, ceilings and partitions.

"Over 300 Non-Clogging Sewage Pumps"

A circular with the above title is being distributed by Yeomans Brothers Company of Chicago. The circular illustrates both horizontal and vertical sewage pumps for municipal service, and also screenless sewage ejectors



"CHICAGO" No. 2
Power Pipe Threading Machine

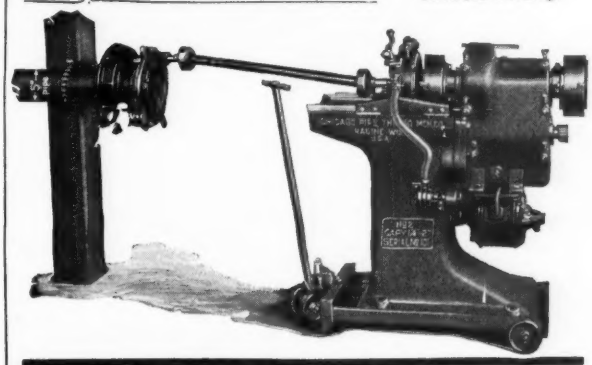
For Production and Precision Threading

PORTABLE

Capacity ¼" to 2" Pipe
" ⅛" to 1⅛" Bolt

FEATURING:
1. Quick Die Change
2. Automatic Die Head
3. Three Speeds
4. Perfected Oil Control

Send for Catalog.



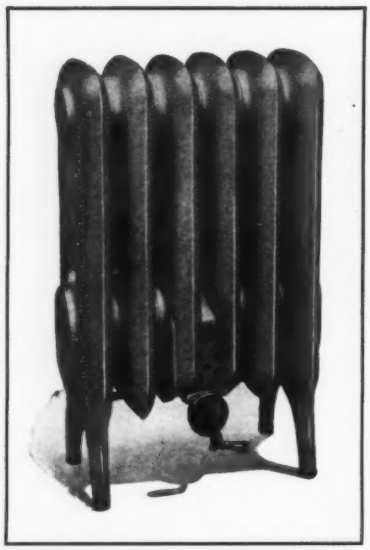
CHICAGO PIPETHREAD MACHINE CO.
Office and Factory: 1615 Racine St., RACINE, WIS. U. S. A.

Low Price

When you stop to consider the superior construction of the Dubé Combined Garbage Burning Water Heater, you'll wonder how it is possible to price it so reasonably.

We are able to do this because of our buying influence which has opened to us the very best sources for raw materials. The Dubé Heater is not only low in price and economical in operation but allows you a fine profit, too.

DUBÉ BOILER WORKS
1244 E. 73rd St. :: Chicago, Ill.



for HOMES, APARTMENTS, STORES, GARAGES, CHURCHES and FACTORIES

Comet Gas Radiators*

Every building in your community—from the smallest home to the largest apartment, store, garage, church or factory—is a prospect for Comet Gas Radiators.

For the home owner, Comet Radiators provide even, sure heat, at small cost and at the minimum of attention on his part.

For the apartment building owner, the Comet makes possible a big saving in janitor expense because each Comet is an individual unit which can be attended by the tenant who also benefits in that he regulates his own heating bill and pays only for what he uses.

Stores, garages, churches, and factories will find Comet heating as efficient and economical as the home or apartment building owner. Let us send you the information and prices that will show you the way to new profits with Comet.

COMET RADIATOR COMPANY
2010 Market Street Philadelphia, Pa.

**Approved by American Gas Association*

for city building service. A list of 321 sewage pumps installed in city buildings, hotel, industrial plants, etc., within a period of about three years is given.

Folder of EverHot Heater Company

A folder describing its new automatic side arm heater has just been issued by EverHot Heater Company, of Detroit, Mich. An illustration shows this heater attached to a range boiler, and on a sectional view the various parts are pointed out. The draft governor, water jacket, water core, thermostat, burner pipe, etc., are described.

"Several Cellars and What They Revealed"

A booklet entitled "Several Cellars and What They Revealed" has just been published by Combustion Specialties Corporation of New York City. This booklet consists of a series of illustrations showing various boiler installations equipped with the corporation's draft-balancers, consisting of aluminum fan housing and adapter castings, bolted to ashpit of boiler. The booklet also contains selections from an article, "More Heat from the Pound of Coal."

Bulletin on Unit Heaters

The New York Blower Company, of Chicago, has just issued a bulletin, printed in black and red, describing its overhead mounted type of unit heaters and its floor mounted unit heaters. A series of six illustrations shows various models.

THIS WAS NEWS 1907 20 YEARS AGO

December 21, 1907

The Iron City Sanitary Manufacturing Co., with general offices at Pittsburgh and plant at Zelienople, Pa., has had plans prepared for a new foundry building, 60 by 240 ft. The building will be equipped with sixteen pneumatic molding machines designed for molding large bathtubs and other sanitary ware.

———1907———

The National Association of Brass Manufacturers held its annual meeting at the Hotel Astor in New York City, on December 11 and 12. A. S. Hills, of Haydenville, Mass., was elected president, and W. M. Webster, of Chicago, was re-elected general commissioner.

———1907———

The Ruud Manufacturing Co., of Pittsburgh, Pa., which recently purchased a large new building and property in the Penn avenue manufacturing district in Pittsburgh, has started to remodel the building, preparatory to moving from the present plant, which is located on Second avenue.

———1907———

A memorial has been addressed to Mayor Busse and the city council of Chicago upon the need of public comfort stations in this city. The sum of $100,000 *is asked as an appropriation for the construction of six such stations within the loop district.*

———1907———

R. T. Crane, president and founder of Crane Co., Chicago, played the part of Santa Claus to the poor families of the ghetto district of Chicago, when he conveyed, for the sum of $1, to Hull House, the grounds and newly completed four-story nursery in Ewing street, near Halsted. While Hull House will hold the deed for the property, which is valued at about $60,000, a long term lease will be issued to the Chicago Relief and Aid Society, and the nursery will be managed entirely by the society.

CONVENTION DATES

January 9, 1928.—The semi-annual meeting of the Florida Society of Plumbing Inspectors to be held at Bradentown, with headquarters at the Dixie Grande Hotel.

January 9, 10 and 11, 1928.—The annual conference of Association Presidents and Secretaries, at Pittsburgh, Pa., with headquarters at the Schenley hotel.

January 9 to 20, 1928.—The fourth annual conference for Training Plumbing and Heating Instructors, at Pittsburgh, Pa., under the auspices of the University of Pittsburgh, Carnegie Institute of Technology and the Trade Extension Bureau.

January 10, 11 and 12, 1928.—The eighth annual convention of the South Dakota Master Plumbers' Association to be held in Sioux Falls.

January 17, 18 and 19, 1928.—The thirty-fourth annual convention of the Wisconsin Master Plumbers' Association, to be held in Milwaukee.

January 23, 24 and 25, 1928.—Three-Day Institute for Master Plumbers to be held at New York University in conjunction with the New York State Association of Master Plumbers.

January 23, 24, 25 and 26, 1928.—The annual meeting of the American Society of Heating and Ventilating Engineers, in New York City, with headquarters at the Hotel Pennsylvania.

January 24, 25 and 26, 1928.—The annual convention of the Illinois Master Plumbers' Association to be held at Moline.

January 31 and February 1 and 2, 1928.—The fortieth annual convention of the Iowa Master Plumbers' Association to be held in Cedar Rapids.

February 7 and 8, 1928.—The thirty-fourth annual convention of the Minnesota Retail Plumbers' Association to be held in St. Paul.

February 14, 15 and 16, 1928.—The thirty-seventh annual convention of the Ohio State Association of Master Plumbers, at Cleveland, Ohio, with headquarters at Hotel Winton.

February 14, 15 and 16, 1928.—Plumbing Conference at the Massachusetts Institute of Technology, Cambridge, Mass., under the auspices of the Massachusetts State Association of Master Plumbers and the Massachusetts Sanitary Club.

February 14 to 18, 1928.—The Midwestern Engineering and Power Exposition, at Coliseum, Chicago.

February 21-28, 1928.—The tenth annual Own Your Home Building and Equipment Exposition of New York City, to be held at the Madison Square Garden.

March 12, 13 and 14, 1928.—The annual convention of the Indiana Society of Sanitary Engineers, at Gary, Ind.

March 19, 20 and 21, 1928.—The forty-fourth annual convention of the Missouri State Association of Master Plumbers.

March 31 to April 7, 1928.—The eighth annual Own Your Home Building and Equipment Exposition, at the Coliseum, Chicago.

April 3, 4 and 5, 1928.—The annual convention of the American Oil Burner Association at Stevens Hotel, Chicago.

April 9, 10 and 11, 1928.—The forty-fifth annual convention of the Massachusetts State Association of Master Plumbers, to be held in Boston, with headquarters in the Statler Hotel.

April 10, 11 and 12, 1928.—The annual convention of the Michigan State Association of Plumbing and Heating Dealers to be held at Bay City, with headquarters at the Wenonah Hotel.

April 16 and 17, 1928.—The fifth annual convention of the Virginia Associated Plumbing and Heating Contractors, to be held at Salem, Va.

April 16, 17 and 18, 1928.—The thirty-ninth annual convention of the Associated Master Plumbers of Texas, to be held at El Paso, with headquarters at the Paso del Norte Hotel.

April 23 and 24, 1928.—The sixth annual convention of the Florida State Association of Master Plumbers and Heating Dealers, Inc., to be held at Winter Haven.

April 26 and 27, 1928.—The annual convention of the Georgia State Association of Master Plumbers to be held at Savannah, with headquarters at the DeSoto Hotel.

May 8 and 9, 1928.—The thirty-eighth annual convention of the Connecticut Master Plumbers' Association, tentatively scheduled to be held in Waterbury.

May 10, 11 and 12, 1928.—The annual convention of the National Association of Plumbing and Heating Salesmen at Pittsburgh, Pa., with headquarters at Webster Hall.

May 14 and 15, 1928.—The twenty-sixth annual convention

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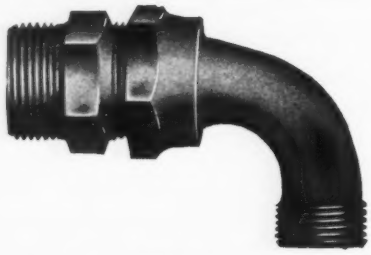

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HERE ARE THE ANSWERS

(Questions will be found on page 15)

1.—The friction in a 45-degree elbow is about 49 per cent of that in the 90-degree elbow for a velocity 3 ft. per second and a 3-inch elbow.

2.—About 20 per cent reduction is usually allowed.

3.—If lines are not vented properly, some gas will be absorbed by the water in the seal, and given off at the top.

4.—From fifty to seventy per cent.

5.—From one to fifteen pounds pressure per square inch.

6.—It is the rate of discharge down the soil-stack.

of the Oklahoma State Association of Master Plumbers, to be held in Tulsa.

May 14, 15 and 16, 1928.—The twenty-seventh annual convention of the California State Master Plumbers' Association to be held in San Francisco, with headquarters at the Clift Hotel.

May 15 and 16, 1928.—The thirty-fourth annual convention of the Pennsylvania State Association of Master Plumbers to be held at Reading, with headquarters in the Rajah Temple.

June 18, 1928.—The thirtieth annual convention of the Associated Master Plumbers of Tennessee to be held in Memphis.

June 19, 20 and 21, 1928.—The forty-sixth annual convention of the National Association of Master Plumbers in Memphis, Tenn., with headquarters in the Peabody Hotel.

COMING TRADE EVENTS

January 9, 1928.—The annual Ladies' Night of the North Hudson Master Plumbers' Association to be held at the Elks' Club, Union City, N. J.

January 10, 1928.—The annual dinner of the Master Plumbers' Association of Boston and Vicinity, Inc.

March 1, 1928.—The thirteenth annual ball of the Master Plumbers Association of Baltimore City, Inc., to be held at Lehman's Hall.

ELECT NEW OFFICERS

At the last regular meeting of the Wisconsin Valley Sanitary Club which was held at Wausau, Wis., on November 26, the following officers were elected for the ensuing year: President, M. L. Tisch, of Wausau; vice president, L. J. Eron, of Wisconsin Rapids; secretary-treasurer, Joseph J. Stadler, 610 South Central avenue, Marshfield; sergeant-at-arms, Mike Kubisiak, of Wisconsin Rapids.

ERIE SANITARIANS HEAR TALK ON ASSOCIATION MANAGING

The Erie Sanitary Association, at its regular monthly meeting on November 30, 1927, at the Hotel Lawrence, heard A. R. Herske, manager of the Heating and Piping Contractors Association of Cleveland, Ohio. Mr. Herske's very interesting talk on "Association Managership" served to point out to the members the many advantages of employing a full-time secretary for manager.

After the regular meeting the contractors were guests of the Hoffman Specialty Co. for the rest of the evening. The movie, "Foiling the Heat Thief," was shown, after which Charles Stewart, of Hoffman Specialty Co., gave a very interesting talk on merchandising. After a short open discussion the crowd retired to one of the private dining rooms, where a buffet luncheon was served.

THE TRADE

WITH MASTER PLUMBERS AND HEATING CONTRACTORS

COMMITTEES OF THREE GROUPS MEET IN NEW YORK

The committees from the American Society of Heating and Ventilating Engineers, the Heating and Piping Contractors National Association, and the American Boiler Mfrs.' Association, which have under consideration the preparation of a standard code for the rating of low pressure heating boilers, held several meetings in New York City during the week ending December 10. The opportunity to discuss standard ratings was made possible because a great many of the committee members were in New York to attend the sixth annual Power Show.

HEATING CONTRACTORS PASS MANY RESOLUTIONS

Many constructive resolutions were passed by local associations affiliated with the Heating and Piping Contractors National Association at the meeting they held in New York City the early part of the month. The ones of general interest include the conference's opinion on municipal permits for the installation of heating apparatus, its idea of local smoke ordinances, the question of conferences between members of different locals, its approval of getting information on a quantity survey, its belief that chattel mortgage statutes be studied, and the adoption of a vote of thanks to the Chicago association.

The resolutions follow:

"RESOLVED, That the board of directors be advised that the mature consideration of the secretaries assembled here is of the opinion that municipal permits for the installation of heating apparatus are economically unsound, and should be opposed in all cases.

"RESOLVED, That the variations existing in the smoke ordinances of a number of cities where local associations of heating contractors exist are such as to merit the attention of the National Association in collecting technical information for the guidance of existing and new locals in the revisions of existing and proposed new smoke ordinances.

"RESOLVED, That members of the board of directors and officers of the National Association expend every effort possible toward suggesting that all members of the National Association, while visiting other cities, drop into the local organizations for the purpose of extending such personal help as possible, and that members of the board of directors acquaint the National organization with their itinerary when away from home, so that meetings of local organizations might be arranged for the purpose of inviting the directors to address the various local meetings. It is the opinion of the secretaries that visits of nationally known directors carry prestige and will be instrumental in aiding the various locals visited.

"RESOLVED, That the National organization obtain as much information as possible in connection with quantity survey, and have such information available for distribution in the near future, it being the consensus of opinion of the secretaries that quantity survey in connection with certified heating might prove of value.

"RESOLVED, That the National Association investigate thoroughly the chattel mortgage statutes, for the purpose of aiding the locals; and

"RESOLVED, That the attention of the board of directors be called to the fact that the ever increasing tendency towards tapping the marketing of replacements of old-time equipment will demand additional information with reference to chattel mortgages, owing to the fact that this type of work will be conducted almost wholly under the partial payment plan.

"RESOLVED, That the board of directors extend a vote of thanks to the Chicago Association for its generosity in permitting the use of advertising forms for Certified Heating."

TENNESSEE CONVENTION TO PRECEDE NATIONAL

The thirtieth annual convention of the Associated Master Plumbers of Tennessee will be held June 18, 1928, in Memphis. As this date is the day before the national association convention in the same city, the same headquarters will serve the Tennessee meeting.

THREE-DAY INSTITUTE TO BE HELD AT NEW YORK UNIVERSITY

New York University, in conjunction with the New York State Association of Master Plumbers, announces a Three-Day Institute for Master Plumbers. The purpose is to get better co-operation between the practical plumbers and the scientists who have to do with the same or similar problems. Lectures and laboratory demonstrations will be given. These will illustrate the application of science to the practical problems with which the plumbers are constantly confronted.

Experience has shown that this plan of a three-day institute for master plumbers is extremely valuable. It has been tried out successfully at the Massachusetts Institute of Technology, the Carnegie Institute of Technology, and the University of Illinois, but it is hoped that this continuance of the plan at the New York University will warrant its being made a permanent annual institution.

The period covered by this session of the institute will be January 23, 24 and 25, inclusive. The place assigned is the College of Engineering, New York University Campus, located at University avenue and Hall of Fame Terrace, Borough of Bronx, New York City.

The holding of the institute at New York University was endorsed by the New York State Association of Master Plumbers at its annual convention in New York City last March. Following the endorsement, Martin W. Utz of Rochester, the newly elected president, named the following master plumbers as members of a special committee to co-operate with a committee from New York University: Stephen H. Welch, chairman, Walter Heap and Thomas J. Whalen, for the purpose of preparing a program for the institute. The committee from the university consists of Dean Collins P. Bliss and Professors Walter S. L. Cleverdon and Joseph W. Roe. The following tentative program was approved by both committees:

Monday, January 23: 9 a. m. to 10:30 a. m.—Registration, Main Hall of Nichols Chemical Laboratory.

11 a. m. to 12:30 p. m.—Opening address by Chancellor Elmer E. Brown. Address by Judge McKee, president of the Board of Aldermen, New York City. Gould Memorial Library Auditorium.

2 p. m. to 4:30 p. m.—Two sessions: Lectures and discussion.

Second and Third Days: 10 a. m. to 12:30 p. m. and 2 p. m. to 4:30 p. m.—Regular sessions: Lectures and discussion.

Each day, from 12:30 p. m. to 2 p. m., demonstrations will be given in the laboratories, giving the individual a better opportunity to see the work in which he is most interested, and to get in personal contact with the demonstrator or instructor. This period will also be used for luncheon at the cafeteria on the campus. The sessions are to be limited to one hour and fifteen minutes each, one hour for lectures and fifteen minutes for discussion.

Approved Subjects for Lectures and Discussion

1. Application of Chemistry to Practical Plumbing Problems.
2. Bacteriology and Its Application to Practical Plumbing Problems.
3. The Water Supply of Buildings, Including Piping, Tanks, Pumps, Meters, etc.
4. Sprinkler Systems, Stand Pipes, and Other Fire Fighting Equipment.
5. Rural Water Supplies and Independent Plants.
6. Hot Water Supplies—Methods of Heating.
7. One Pipe Steam System for Residence Heating.
8. Methods of Sewage Disposal and Sewage Treatment.
9. Commercial Law and the Plumber: Lien Laws and their application. Value of contracts and credit information. Relation of sub-contracts to main contracts. Responsibilities of owners, contractors, and architects. Relation of building and plumbing codes to legal interpretation in their various applications.
10. Oxy-acetylene Welding.
11. Domestic Refrigeration.

The master plumbers will have a dinner at the close of the institute on Wednesday night January 25. Chairman Stephen H. Welch, will give complete details at a later date. The following are some of the members of the faculty of New York University who will deliver the lectures and give laboratory demonstrations: William W. Brush, chief engineer of water supply, New York City, lecturer in engineering at New York University; A. C. Hutson, principal assistant engineer, National Board of Fire Underwriters, New York City, lecturer in engineering, New York University; Walter S. L. Cleverdon, formerly associate professor of sanitary engineering at New York University, now supervisor of property at New York University.

PLUMBING CONFERENCE TO BE HELD AGAIN IN MASSACHUSETTS

The dates for the next conference to be held through the co-operation of the Massachusetts State Association of Master Plumbers, the Massachusetts Sanitary Club and the Massachusetts Institute of Technology, have been set for February 14, 15 and 16, it is announced by Chairman Wallace T. Wordell of the committee. Last year this conference was very successful, with a much larger turnout for the institute than the sponsors expected. Mr. Wordell is now circularizing those who the committee thinks will be interested, asking them to suggest three subjects for discussion during the conference, and also to state whether they favor a two or three-day meeting.

NEW RICHMOND ADVISORY COMMITTEE MEETS

The members of the regular advisory committee for the Master Plumbers and Heating Association of Richmond, Va., for December and January have held their first meeting at association headquarters and become organized. The members are E. G. Harris, M. L. Longworth, J. Stuart Graham, H. G. Longworth, E. W. Rudd and E. L. Stertz.

COMMITTEE WORKS ON LICENSING

Members of the Manhattan branch, Association of Master Plumbers of the City of New York, are actively cooperating in the movement to rid Manhattan Island of the unlicensed plumber. A great many violations are being reported to the committee in charge of the work, and this committee is preferring charges against the offenders, as well as against those licensed men who cover up the work of the unlicensed plumbers by letting them use their licenses.

The committee working for the revision of the lien laws of New York State, under the leadership of Jere L. Murphy, is still working on the draft of the proposed changes. It is hoped that these will be in good enough shape to hold a meeting of the committee in the near future. Master plumbers are active on this committee, with representatives of all boroughs in the greater city assisting, and in addition to this the masters have contributed more toward the financial support of the project than any other trade interested.

SAN ANGELO PLUMBERS ORGANIZE

Organization of the San Angelo (Texas) Master Plumbers and Heating Contractors Association was effected at a meeting held in that city recently and presided over by R. G. Thomas of San Antonio, director of the National Association of Master Plumbers. Officers of the new association are: A. T. Chaney, president; John Bowen, vice president; N. W. Charlton, secretary; A. L. Petty, treasurer. R. E. Peacock and Nat Henderson were named as associate custodians of funds.

The meeting at which this association was formed was, according to Mr. Thomas, one of the most enthusiastic he has ever attended, and practically every plumbing firm in San Angelo is represented in the body. Constitution and by-laws will follow those adopted by other local organizations, and a constructive program of education and advancement will be worked out.

Those firms coming into the association as charter members were: Braden-Hudson-Wangler Co., Chaney Plumbing Co., Bowen Plumbing Co., Petty Plumbing Co., Modern Plumbing & Heating Co., H. Oberhampf, Nat Henderson & Bros., and the Home Plumbing Co.

HEATING AND PIPING CONTRACTORS ASSOCIATION FORMING IN SAN FRANCISCO

On December 5 a representative body of heating contractors of San Francisco gathered at the States Restaurant and formulated tentative plans toward the organization of a local association of Heating and Piping Contractors, which will eventually become identified with the national body.

Prominent among those taking an active part in the organization work are: Curtis N. Gilley, of the Gilley-Schmid Co.; William B. Scott, of the Scott Co.; W. D. O'Mara, of O'Mara & Stewart, and others.

EXCHANGE CLUB HEARS MESSAGE OF SANITATION

On Tuesday, December 6, Thomas F. Carson, executive secretary of the Detroit Association of Sanitary and Heating Contractors, addressed members of the West Detroit Exchange Club at their luncheon held at Findlater Temple. He took for his subject the contribution of the plumbing and heating industry to civilization. *Mr. Carson traced* the development of plumbing through the ages, and paid especial tribute to the fine art of living as practiced by the Greeks and Romans. He emphasized the fact that the ancient Greek and Roman baths were one of the world's greatest wonders, and that the golden age of the Greek and Roman people surpasses all others in civilization. The

dark ages, he described as being practically a thousand years without a bath.

"The modern plumber is in every sense a highly skilled and efficient sanitarian fully able to compete with the problems facing him," he said. He emphasized the point that the plumber is highly trained and experienced, and that his contribution to the community is equally as great as that of the doctor and lawyer. He stated that the plumber is a protector of mankind, for he has caused pipes to carry water, rather than women, and that he has made the habitations of man sanitary and healthful.

"The French failed to build the Panama Canal," he continued, "because they neglected the most simple and common rules of sanitation. Their fine equipment and engineering knowledge was useless in the battle against disease." In speaking of the heating contractors, Mr. Carson stated that theirs was a remarkable contribution to the well-being of man, because the heating industry has made homes more comfortable and healthful. He stated that it was as absurd to compare modern heating plants with heating plants of fifty years ago as it was to compare Fulton's "Claremont" with a modern greyhound of the sea.

He pointed out that buildings were simply so much construction material until the plumbing and heating contractor installed his work. "When the plumbing and heating is installed the building becomes a living thing supplied with warmth and circulation, a fit place for the habitation of mankind," he added. In closing, Mr. Carson stated that the plumbing and heating contractors are engaged in teaching men how to live life more fully.

California Local Officers in Conference

THE general conference of presidents and secretaries of local master plumbers' associations throughout California, held at the Hotel Fresno, Fresno, Calif., on December 10, was not as well attended as was the one held at the same place a year ago. However, the current conference made up in enthusiasm and interest what it lacked in attendance, and appeared to be interesting to all who attended.

The conference was opened at 2 p. m. by State President C. R. Hutton, of Los Angeles, who welcomed the delegates present and expressed the hope that every man there might derive benefit from the deliberations, and that in turn each take home to his local association some ideas that might be of value in assisting the work of both the local association and the state association. In order that the work of the conference might proceed in an orderly manner, he purposed calling upon the presidents of the locals and then upon the secretaries of the locals in turn, giving any who wished the opportunity to discuss anything which might come up in the course of the reports. In pursuance of this plan of procedure, President Hutton called upon Ray Walters, president of the Bakersfield association, to report.

Mr. Walters said that work was rather quiet in the Bakersfield district just at the present time; nevertheless, the members of the association were working together harmoniously and for the most part they were making some money. This was true particularly in contract work. Owing to conditions peculiar to Bakersfield, the retail trade of the plumbers was subjected to rather difficult competitive conditions which rendered the making of a profit somewhat problematical, but conditions were better in the contracting field, and in this latter most of the members had been able to make a living profit on the work they had been enabled to secure.

The plumbers in Kern county were working for a county ordinance and for a revision of the Bakersfield city ordinance. They were hopeful that both might be attained, he added. In conclusion, Mr. Walters said the Bakersfield association included in its membership all of the Bakersfield master plumbers.

At the conclusion of this report, President Hutton said it certainly was inspiring to witness the spirit of co-operation which was manifested throughout the San Joaquin Valley. He said that this was shown in the regular meeting of the Valley association, held the previous evening at the Hotel Fresno, and that inasmuch as Fresno held the southernmost frontier in the San Joaquin Valley Association, it was not surprising to learn from Mr. Walters' report that it was 100 per cent.

James F. Mauzy of the Contra Costa association, reported next. Mr. Mauzy said there had been no increases in membership in his association during the past year, but that the interest of the association had been maintained, and as a result, he thought general conditions were showing some improvement in that territory. He said that the worst trouble the plumbers had to contend with was the extension of credits by some of the jobbers to irresponsible concerns. In his judgment, the only solution of this lay through co-operation with the jobbers in an endeavor to raise the standard of ethics among the plumbers, to induce the back yard plumbers to move out onto the street, and to carry a representative line of goods.

I. E. Gould, Glendale president; State President C. R. Hutton of Los Angeles; W. F. Wood, business manager of the Los Angeles association

Mr. Mauzy also paid a compliment to the Valley association. He said he had been privileged to attend the meeting on the preceding night, and was amazed at the way the Valley association had seized opportunities to further its work and influence.

W. W. Mott, secretary and manager of the Sacramento association, being the only delegate from the association present at the conference, reported next.

Mr. Mott said his association had been functioning for many years, and in fact, was one of the oldest locals in the state. It managed to hold the interest of members in Sacramento and maintained its membership at all times up to an efficient standard.

He pointed out that fully 70 per cent of the business done by the members of his association came to the office unsolicited.

Mr. Mott said that it seemed a peculiar proposition that so many times the jobbers would apparently penalize their good customers in order to favor some more or less irresponsible customer. In his opinion, until the manufacturers and jobbers realized this and effected some solution to this difficulty, it would be impossible for the

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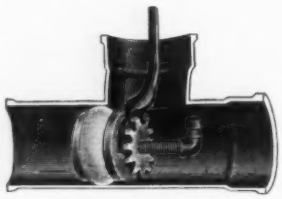

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plumbing industry to improve much. In conclusion the speaker advocated the adoption by every master plumber of some good and efficient bookkeeping system, as he felt assured that thereby they could ascertain whether or not they were doing their business on a profitable basis.

I. Clark, of Visalia, in adverting to both the credit situation, and to the recommendation of Mr. Mott relative to a bookkeeping system, said that the jobber should treat the applicant for credit in just the same way that a bank would treat him. Mr. Clark said that when the business man wanted to borrow money from a bank, he had to submit a statement of his business, and if he wanted credit

L. F. Stuffler, Los Angeles president; Bruce Clark, state executive secretary; Claude Hickman, San Pedro president

from a jobbing house, which was identical with the borrowing of money from a bank, the jobber should insist upon seeing a statement of the applicant's business. If every jobber would do this, the plumber would be compelled to keep an adequate set of books and, in addition, this method of procedure in the matter of extending credit would tend to solve present difficulties in the credit situation.

Referring to the suggestion made by Mr. Mott that the jobbers adopt some code of procedure in handling their businesses, President Hutton at this point told the conference about the work that was being accomplished in Los Angeles by W. F. Wood, business manager of the Los Angeles Merchant Plumbers' Association, through the organization of the "collective criticism and complaint" group.

L. A. Remy, president of the Long Beach association, being impressed by the remarks of President Hutton, moved that the conference approve the Los Angeles "rules of procedure" and that every delegate take them home for submission to his individual association. The motion was adopted unanimously.

New Local Association Grows

President J. T. Anderson, of the San Joaquin Valley Association, upon being called upon for his report, suggested that Secretary Foin be permitted to report in his stead. Mr. Foin contented himself by handing to State Secretary Bruce Clark the report he had made before the regular meeting of the Valley association the preceding night, with the request that it be read to the conference as his report of what the Valley association had done.

This report was largely historical in its nature, and dealt with the record of what the association had accomplished in relation to membership principally. It told of the formation of the association at Dinuba, Calif., on December 28, 1926, when six towns in the valley were represented, and thirteen plumbers joined the association. It then proceeded with the account of the succession of meetings that had been held during the past eleven months at various centers in the southern part of the San Joaquin Valley. The net result of these meetings was that as of December 1, 1927 the Valley association numbered 57 members, drawn from 19 towns within its territory.

Ira E. Gould, president of the Glendale association, reported that with the exception of two or three plumbers within its territory, the Glendale association now contained practically every plumber it wanted within its ranks. Mr. Gould said that by keeping the quality of the membership high, rated by the standards of the industry, the Glendale association was really a de luxe aggregation of plumbers. He said that weekly meetings were held. In time the association hoped to own and occupy its own building. The industry in Glendale had its troubles, like most of the locals elsewhere in Southern California, but by the maintenance of a high ethical standard of procedure the Glendale body did what it could to minimize the effects of these, he said in conclusion.

L. A. Remy, president of the Long Beach association, detailed at some length the troubles his association had had to get efficiently organized and to maintain that efficiency unimpaired. He was glad to report that for the most part the members were operating harmoniously, and were striving to keep the industry upon a high level. Generally speaking, he thought most of the reputable plumbers in the state were loyal to association work, pointing out that the attendance at this conference was proof. Nevertheless, the association got nowhere by preaching to these men who manifested their loyalty by attending these conferences, and the other meetings of the associations. The men in the industry who should be reached never are present at any of these meetings and never hear anything the associations do. The only way to reach these outsiders was to institute and conduct an educational campaign which should be so designed and administered as to reach them, he thought. Every man in the industry owes it to himself to uplift the industry and to leave it better because of his past presence in it. Most of the members have descendants, and it is the individual duty of each one to induct these descendants into a business which shall be better than it was when he originally went into it, Mr. Remy concluded.

Lawrence Stuffler, president of the Los Angeles association, told of the manifold activities in which the Los Angeles association is engaged, adverting to the work of Business Manager Wood in organizing the "collective criticism and complaint" group.

W. H. Picard, president of the Oakland, Berkeley and Alameda association, asked to have his report deferred until afternoon, and yielded the floor to V. A. Edgeworth, secretary of the association.

Mr. Edgeworth's report had to do largely with the efforts that had been put forth by his association to attract a larger attendance at the regular meetings. The secretary read some statistics revealing that while the average attendance during the year 1925 had been 18, this had increased during 1926 to 27, while during the last six months the average had been 34, with 47 at the last meeting of the association. This progressive increase had been due to the efforts of the educational committee. Managers of jobbing houses had been invited to attend the meetings to speak to the members; successful master plumbers also had been invited to address their fellows on subjects of interest to the industry; also lunches had been served. In Mr. Edgeworth's opinion every association must get right down to rock bottom and try to interest the members by discussing just the ordinary everyday matters which are of interest to everybody engaged in the industry. The Oakland association had tried to inject a human touch into these meetings by having representatives of the jobbers present.

The Thomas Haverty Co., 316 East Eighth street, Los Angeles, Calif., has been awarded the plumbing contract on a four-story apartment at 241 South Mariposa avenue.

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IT WILL appeal to any practical steamfitter because of its commonsense design, good materials and sturdy construction. Easy to get at any part—every part interchangeable. Genuine Jenkins disc used. For one pipe steam and forced systems of hot water you should use these fine valves.

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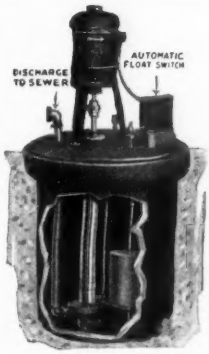

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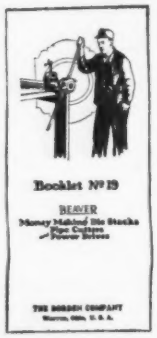

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And the funny thing about it is that the ideas presented in No. 19 Booklet are so clear and so simple that you'll wonder why you never thought of them before. A card or a letter will bring your copy.

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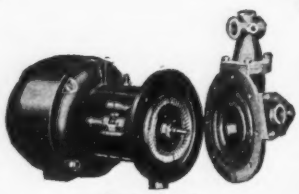

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THE DECATUR PUMP CO.
Decatur, Illinois

Women's Auxiliaries

San Francisco Auxiliary Elects Officers

The December 1st meeting of the San Francisco Auxiliary was featured by the election of officers for the coming year. The new official roster is as follows: President, Mrs. Chas. Seipp; secretary and treasurer, Mrs. Lena Sands, and marshal, Mrs. Ravani. These ladies will be formally installed the first of the year. Following the election of officers and the disposal of routine affairs, a most enjoyable afternoon was spent at whist, in which over forty members participated. High scores were held by Mrs. J. Lieber, Mrs. H. Hernot, Mrs. J. Hoopes, Mrs. D. L. Mustard, Mrs. Dela Bullerdieck, Mrs. J. C. Sands, and Mrs. Wm. Rowe. In the evening the auxiliary tendered a banquet to their members and friends, this event likewise being held at Plumbers' Hall, 120 Page street. The guest of honor was Mrs. Bruce Clark, whose husband is secretary of the California State Master Plumbers' Association. Whist was played at the conclusion of the dinner service. Dancing was also on the program. Mrs. J. J. Deasy headed the committee having charge of the evening's festivities.

Extends Greetings to Auxiliary Members

The following communication has been received from Mrs. W. E. McAndrew, of Tampa, Fla., third vice president of the Women's Auxiliary to the National Association of Master Plumbers:

"As a member of the National official family of the Women's Auxiliary to the Master Plumbers' Association, I wish to extend through the medium of your valued paper my sincere gratitude to each national, state and local member for the part they have taken in the good work that has been accomplished during the past year.

"Let us continue our work in the New Year with even greater energy, always looking forward with success our goal, and strive to make 1928 our banner year.

"It is with pleasure that I extend to the Auxiliary members throughout the country heartiest Christmas greetings and my best wishes for a prosperous New Year."

Salt Lake City Auxiliary Holds Meeting

The Ladies' Auxiliary of the Salt Lake City, Utah, Association held its regular monthly meeting on December 7 at the home of Mrs. William Duncan. Progressive bridge and refreshments were enjoyed.

The next meeting is scheduled for January 4 at the home of Mrs. Wayne F. Carbis.

Milwaukee Auxiliary to Master Plumbers' Association Re-elects Officers

The Woman's Auxiliary of the Milwaukee Master Plumbers' Association re-elected all of their former officers for the ensuing year at the annual meeting held December 5 at Gimbels' Grill. Officers include Mmes. Charles Pelunek, president; Otto Waskow, vice-president; Otto Dittmer, recording secretary; Joseph Brah, corresponding secretary; R. G. Wenzel, treasurer; and Fred C. Kuetemeyer, chairman of the entertainment committee.

Committee appointments for the coming year will be taken care of during the next week, according to Mrs. Pelunek, president.

Officers of the Woman's Auxiliary will be duly installed at a meeting to be held on January 9 at Gimbels' Grill. At this meeting prizes will be given and entertainment will be provided.

A Christmas party for members and families will be held on December 28 from 2 until 6 o'clock. Gifts will be presented to all who attend the Christmas celebration.

Business Changes

Wheaton, Ill.—Charles Ott has purchased a section of property on East Front street and expects to erect an office and plumbing shop shortly.

Ellinwood, Kans.—W. J. Hines has sold the electrical part of his plumbing business to Joseph Hermes.

South Bend, Ind.—The William Otterstein & Son Plumbing & Heating Co. moved recently from 119 South Main street to new quarters at 117 Lincoln Way East.

Anamosa, Iowa—T. L. Doolittle & F. F. Dahms have purchased the business of the Smith Plumbing & Heating Co. from E. W. Smith. The company will now be known as the Anamosa Plumbing & Heating Co.

Scottsbluff, Nebr.—B. E. Rymer, who has been in the plumbing business for several years, will take his two brothers, Theodore and George T., into business with him after January 1, the business to be known as Rymer Bros.

New Business Ventures

Barrington, Ill.—The Barrington Heating & Plumbing Co., with offices in the Commercial building on East Main street, has started business in this city.

Elmhurst, Ill.—The R. C. Todd Plumbing Co. has opened for business at 120 Myrtle avenue. R. C. Todd, proprietor of the business, came to Elmhurst recently from Palm Beach, Fla.

Greeley, Colo.—The E. H. Horton Plumbing & Heating Co. recently filed incorporation papers with the secretary of state in Denver. The company is incorporated with a capital of $10,000 and the incorporators are Emil H. Horton, George L. Horton and Bertha M. Horton. The Hortons are well known to the plumbing industry of

Top picture: President C. W. Gilmour, Mrs. Gilmour, and their two children, of Union City.—Middle picture: Mr. and Mrs. T. S. Ducate and their children.—Bottom picture: Mr. and Mrs. F. Drescher of Woodcliff and their children.—Photos taken at the annual outing of the North Hudson association

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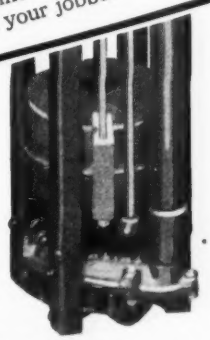
ELECTRIC BASEMENT DRAINER

The NEW 1928 Model Is Ready!

First—

because of merit. Stark pumps lead the field because they are made by the oldest and largest manufacturer of pumps of this class. Best engineering design, most careful workmanship. You should examine a Stark electric basement drainer today. Ask your jobber.



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RADIATOR HANGER

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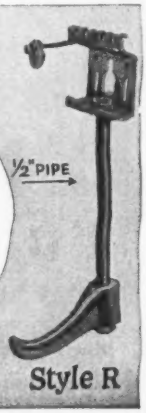

Style R

northern Colorado. Emil Horton several years ago conducted a plumbing business in Loveland, Colo.

Salt Lake City, Utah—A master plumber's license has been issued to W. E. Edwards, 915 Rio Grande avenue.

Salt Lake City, Utah—A master plumber's license has been taken out by the Southeast Plumbing & Heating Co., 184 Coatsville avenue. The organization is composed of George Bowles, Jesse Duffin and Dewitt Porter.

Baltimore, Md.—James Ross, Inc., has been chartered in the plumbing and heating business, at 1170 Sargeant street, by James Ross, Mary E. Ross and Sigmund Kallinsky.

Contracts Awarded

Arlington, Tex.—A. S. Pearce & Son, 510 North Hawkins street, Dallas, have been awarded the plumbing and heating contract for the North Texas Junior Agricultural and Mechanical College.

Tulsa, Okla.—The MacMahon Co., Kansas City, Mo., has been awarded the plumbing and heating contract for the $650,000 Dan Hunt business building.

Knoxville, Tenn.—McGinn & Reiche, 411 West Park avenue, have been awarded the heating contract, and the Engert-Long Plumbing Co., 604 Asylum avenue, the plumbing contract for the warehouse at 415-17 Gay street.

Anniston, Ala.—The Klepsig Plumbing & Heating Co., Eleventh street, has the plumbing and heating work in the remodeling of the Consolidated Publishing Co.'s plant.

San Antonio, Tex.—A. H. Shafer has the plumbing and heating contract in the erection of the new $2,000,000 Milam building under construction for the Travis Investment Co.

Oklahoma City, Okla.—B. Z. Hutchison, 405 West Second street, has the plumbing and heating contract for the $150,000 infirmary building at the University of Oklahoma.

Burlington, Iowa—*Kale & McKay, Inc., Rock Island,* Ill., have been awarded the heating contract for the new power house of the Mercy Hospital. The contract amounted to $19,000.

Haskell, Tex.—The Hastex Plumbing Co., Oliver Williams, manager, has been awarded the plumbing contract for the residence of P. A. Wamble.

Rock Island, Ill.—Ward & McMahon have been awarded the heating contract for the new Edison School with a bid of $23,000. The plumbing contract for the school was awarded to Kale & McKay, Inc., for $13,000.

Boston, Mass.—*The H. E. Whitten Co., 9 Federal street,* will install the heating at the proposed auditorium for the Wentworth Institute. The plumbing work will be done by John Manning, 342 Shawmut avenue.

Framingham, Mass.—The contract for the heating and plumbing work in connection with the new office building now under construction on Irving street for the West Boston Gas Co., was awarded to J. P. Welsh, 16 Irving street.

Boston, Mass.—J. J. Hurley & Co., 104 Broadway, and John Y. Gillespie, 708 Columbia road, South Boston, will *install heating and plumbing systems, respectively,* for the $500,000 officers' dormitory being built by the City on Harrison avenue.

South Manchester, Conn.—John Greene, 123 Maple street, and J. J. Murphy & Son, 38 Ford street, both of Hartford, have the heating and plumbing contracts, respectively, *for the $100,000 grade school being built on* Porter street.

Cambridge, Mass.—Frank E. Cassidy, 60 Broadway, has the heating contract, and H. L. Rose, 282 Franklin street, the plumbing contract, for the large public garage under construction for Klauer Brothers at 345 Franklin street.

Fall River, Mass.—Walter & Sullivan, 973 South Main street, were recently awarded the heating contract for the rectory now being erected at Rodman and Second streets for St. Mary's Cathedral.

Niantic, Conn.—Arthur Follow has been awarded the plumbing and heating contract for the $100,000 maternity hospital being erected by the State in connection with the State Farm for Women.

Stamford, Conn.—N. N. Hamilton, 23 Warren street, was awarded the heating and plumbing contract for the two-story brick apartment house to be built on Oliver street for Thomas Skiba.

Stamford, Conn.—Caporizza & Rosa, West Main street, have been awarded the contract to install the plumbing and heating systems in two new residences to be erected on Manin street.

Bristol, Conn.—Murphy & Sheehy, Main street, have been awarded heating and plumbing contract for two colonial residences under construction on Dorothy road and a similar contract for a residence on Vincent road.

Waterbury, Conn.—P. J. Cronan & Sons, 460 Farmington avenue, will install the heating and plumbing systems in the large residence being built on Bunker Hill avenue from plans by Architect Fred S. Webster.

Top picture: Mr. and Mrs. T. W. Edgerton of Brooklyn; Miss Norma Edgerton; Mrs. Thomas F. Nolan of Albany, N. Y.; *Miss Ann Nolan; National President Nolan; J. J. Dixon of* Brooklyn.—Middle picture: F. B. Barker of Quogue; John F. Rogers of Queens; Otto Simmons of Easthampton; E. J. O'Brien of the Hoffman Specialty Co.—Bottom row: S. H. Oliver of Riverhead; M. W. LeFevre of Water Mill; F. L. Hudson of Greenport; C. E. Martin of Rock Centre.—Photos taken at the recent Montauk Manor meeting of the Long Island associations

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More Thorough
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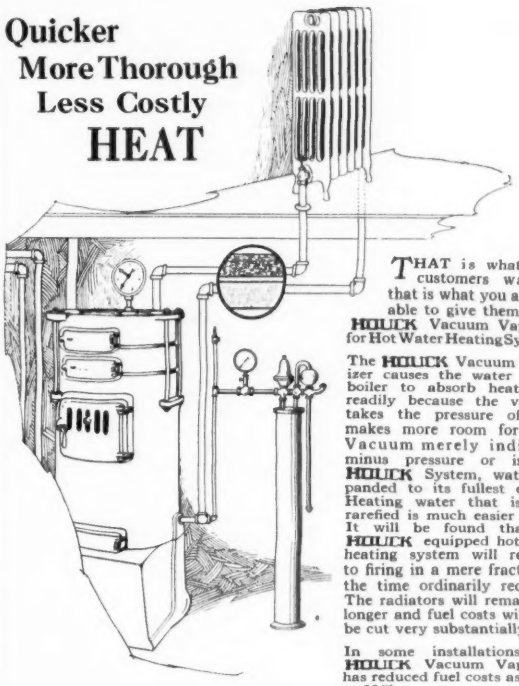
HEAT



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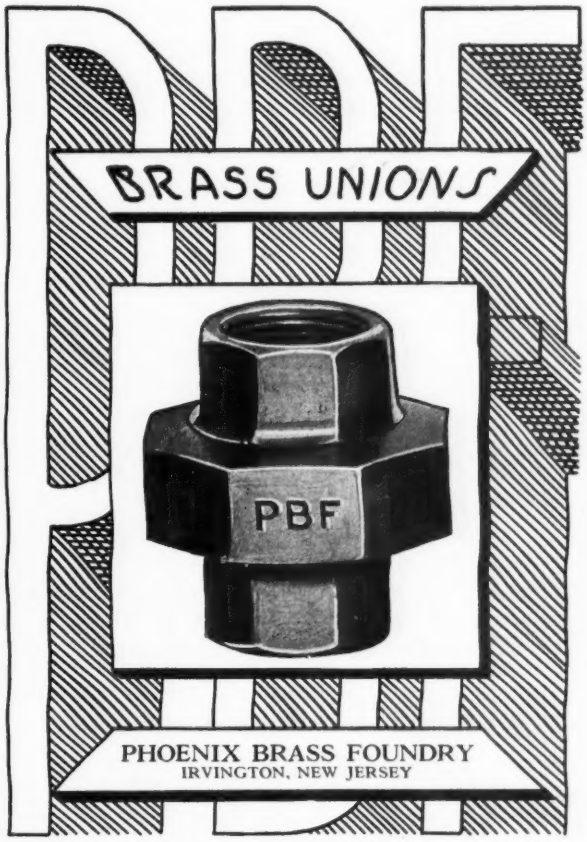

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Bridgeport, Conn.—E. O. Nelson, 137 Clinton avenue, has been selected to do the plumbing and heating work in connection with three new houses being built on Lincoln avenue for Charles G. Rossling of Fairfield.

New Britain, Conn.—Louis Nair, 116 Lafayette street, and J. W. Smith, 937 Stanley street, have plumbing and heating contracts, respectively, for the three-family residence in the course of construction on Pleasant street.

Warwick, R. I.—Helie & Co. have the plumbing contract for three schools to be built at Norwood, Lakewood and Greenwood for the town of Warwick. The heating contract for the projects was given to the Files Engineering Co., Inc., 31 Bourne street, Providence.

Worcester, Mass.—The Brosnan Heating Co., 60 Green street, has been selected to install the heating system for the large addition to the St. Agnes Guild Home under construction for the Roman Catholic Diocese of Springfield. The plumbing contract for the project went to W. R. Bowers of Gold street.

Salt Lake City, Utah—Herbert B. Cromar has been awarded a contract to install approximately thirty fixtures in the new Louis Cates mansion.

Salt Lake City, Utah—The James Plumbing & Heating Co. has been awarded the plumbing and heating contract for the Bryan junior high school addition.

Belle Fourche, S. D.—Wyckoff & Noble have been awarded the plumbing contract for the residence of F. W. Hilliard.

Sioux City, Iowa—E. O. Winkler, 418 West Seventh street, has the plumbing and heating contract for the Pet Animal Hospital.

Newton, Iowa—Carstens Brothers of Ackley have been awarded the plumbing and heating contract for the Telephone Exchange building of the Jasper County Telephone Co.

Peterson, Iowa—Charles Stipp has been awarded the heating contract for the First Congregational Church.

Liberty, Nebr.—Frank Gage of Fairbury has been awarded the heating contract for the school building for District 27.

Kansas City, Mo.—The W. T. Conroy Heating Co., 3039 Jackson street, has been awarded the heating contract for the laundry building of the Wayne Towel Supply Co., 1516 Prospect street.

Kansas City, Mo.—The Laitner Plumbing Co., 611 East Thirtieth street, has the plumbing contract for the Empire Garage at 115 West Thirteenth street.

Kansas City, Mo.—The Brookside Plumbing Co., 5503 Brookside boulevard, has the plumbing contract for the City Ice Co. building.

Kansas City, Mo.—The Laitner Plumbing Co., 611 East Thirtieth street, has the plumbing contract for a residence at 6164 Rockhill road.

Muskogee, Okla.—The O'Connor Co., 411 North Third street, has been awarded the heating and plumbing contract for the courthouse and jail building.

San Antonio, Tex.—A. W. Fuessel, 1903 Virginia boulevard, has the plumbing contract for the factory of the Bell Mfg. Co., Inc.

Cumberland, Md.—The Macfarlane Plumbing & Heating Co. has the plumbing and heating contract for a $90,000 office building for Celanese Corp. of America.

Oneonta, Ala.—P. S. Duckworth of Cullman has been awarded the plumbing and heating contract for the Baptist Church.

Meridian, Miss.—The Southern Plumbing Co., Twenty-second avenue, has been awarded the plumbing contract,

and Walter Kidder, 2109 Sixth street, the heating contract for the Louis Threefoot residence.

St. Louis, Mo.—The Guarantee Heating Co., 1620 Chestnut street, has the heating contract, and John Mohr & Son, 4478 Delmar avenue, the plumbing contract for the Milton H. Tucker residence.

Greenville, S. C.—The plumbing contract for the W. D. Parish residence has been awarded to Edens & Moon, 204 Pendleton street.

Greenville, S. C.—The Pal Piping & Heating Co., South Main street, has the heating contract for the residence of A. L. Straus.

Kerrville, Tex.—W. B. Brown has been awarded the plumbing and heating contract for the Hal Peterson residence.

Whitfield, Miss.—C. A. Hunter, of Alexandria, La., has been awarded the plumbing and heating contract, at $52,697, for the Mississippi Insane Hospital.

Nashville, Tenn.—Harvey Malone, 199 Manchester avenue, has the plumbing contract for the Bringhurst-Reid Co. apartment building.

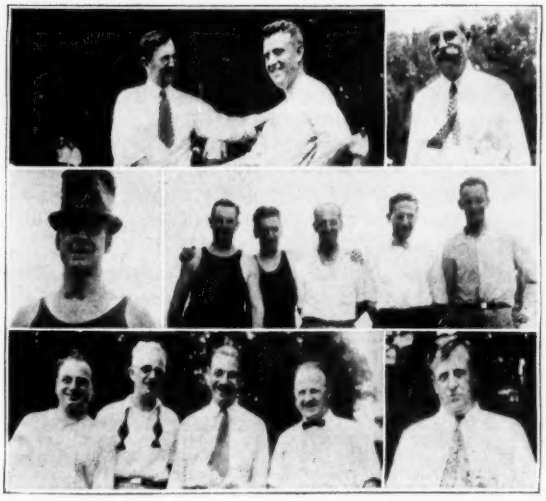
Lakeland, Fla.—D. E. Dorsett has the plumbing and heating contract for two school houses for the Polk County Board.

Shelbyville, Mo.—The Judd Heating & Plumbing Co., Kansas City, Mo., has been awarded the heating and plumbing contract for a school building here.

Concord, N. C.—E. B. Grady has the plumbing contract for South Kannapolis school, and C. W. Christian, Myers Park, Charlotte, the heating contract.

Durham, N. C.—The Dermott Heating Co., 314 Morgan street, has been awarded the heating contract for the Hayti school, at $13,570, and the O'Dell Small Plumbing Co., 318 Morgan street, the plumbing contract at $8,971.

Nebraska City, Nebr.—Robert Mill has been awarded the plumbing contract for the Christian Church.



Top row: William Emery, contractor, congratulating Pitcher L. A. Moore of the contractors' baseball tenm; Henry B. Gombers, secretary of the Heating and Piping Contractors National Association.—Middle row: K. E. Pote of the Fitzgibbons Boiler Co., Inc., winner of the high-hat swimming contest; the committee in charge of the outing, William Emery, Charles Bender, Frank Blest, Gus Bender and Edward Crutchley.—Bottom row: H. Mandle of the Abco Boiler Co.; Parke Holton of Evins F. Glore & Son, Inc.; J. S. Landers of the Abco Boiler Co.; P. Corwin of the Handon Boiler Corp.; A. W. Dovel, president of the association.—Photos taken at the recent annual outing of the Heating Engineers' Association, Inc., of Brooklyn

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WHERE pumping requirements demand large capacities and high pressures Deming "Triplex" Power Pumps can be depended upon for years of continuous service.
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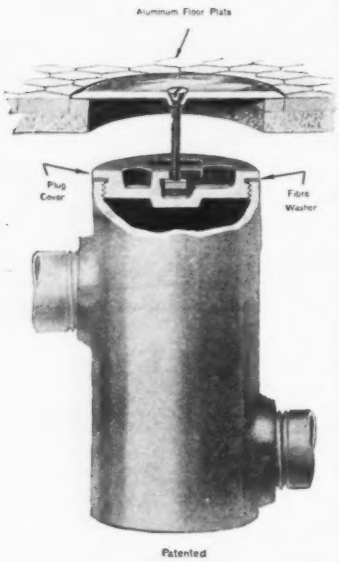

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Stringer Adjustable Universal Drum Trap Covers

The 1½ inch long Brass bolt of this Stringer Adjustable Universal Drum Trap Cover allows a liberal adjustment between the finished floor line and top of Drum Trap.

Furnished complete with Aluminum Floor Plate, Brass Bolt and Nut, Fibre Washer and Plug Cover of either brass or cast-iron.

This is only one of our Specialties that spell economy in roughing-in. Send for catalog.

STRINGER BROS. CO., Inc.

1100 West 38th Street, Chicago, Illinois

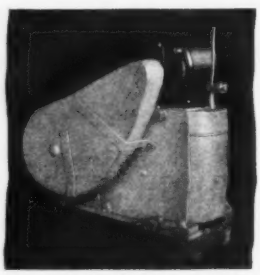
Factories: Gadsden, Alabama
Warehouses: Chicago, Illinois; Gadsden, Alabama

Once sold, a Crane system *stays* sold

THE smooth-running, trouble-free operation of a *Crane 850 Deep Well Water System* delights the buyer and interests every neighbor who sees it at work.

The cushioned upstroke provided by the walking beam type sliding crosshead prevents annoying, wearing pound. Every part is easily accessible with no tool kit but the wrench.

Bearings are machined to .0005 of an inch and are kept flooded by oil from a positive overhead oiling system. When a Crane automatic water system is sold, it stays sold because it is built to endure. Write for full information and selling plan.



Crane 850 Deep Well System. Pumping from depths down to 250 feet. Crane deep and shallow well systems are made to meet any condition.

CRANE

CRANE CO., 836 S. MICHIGAN AVE., CHICAGO, ILL.

Branches in all principal cities

Ottumwa, Iowa—Frank Taylor has been awarded the plumbing and heating contract for the building of the Wonder Stores Co.

Davenport, Iowa—R. Claussen, 617 West Second street, has the plumbing contract, and the Ideal Heating & Construction Co., 428 Harrison street, the heating contract for a residence at 423 East Thirtieth street.

Lincoln, Nebr.—Gordon & Son have the plumbing and heating contract for three dwellings for L. F. Farrell.

Lincoln, Nebr.—Carlson & Son have the plumbing and heating contract for the residence of Laura Wolfe.

Oskaloosa, Iowa—D. E. Sullivan has been awarded the heating contract for the factory building of Fred Jasper Battery Co.

Des Moines, Iowa—The Landis Plumbing Co., 1094 Fourteenth street, has been awarded the plumbing contract for a residence at 655 West Fifty-seventh street.

Memphis, Tenn.—The Hughes Heating Co., 672 Madison street, has been awarded the heating contract, at $25,866, and Rhodes Brothers the plumbing contract, at $24,408, for new Pharmacy and Library building at University of Tennessee Medical College.

Canyon, Tex.—The heating and plumbing contract for the Education building at West Texas State Teachers College has been let to H. E. Persons of Amarillo.

Bay Town, Tex.—The City Plumbing Shop, Goose Creek, has been awarded the plumbing contract for the apartment building of Mrs. Emma Bolan.

Houston, Tex.—The Modern Plumbing & Electric Co., 506 Rusk street, has the plumbing contract for the Don Hall store building.

Seattle, Wash.—The University Plumbing & Heating Co., 3939 University Way, has secured contracts for both plumbing and heating on a building to be remodeled at 1419-23 First avenue.

Portland, Ore.—The Standard Plumbing & Heating Co. is installing plumbing in residences at 1110 Ogden avenue, at 396 East Twenty-ninth street and at 5312 Forty-first avenue.

Portland, Ore.—W. M. Chase is installing plumbing in a business block for A. Nicolai at 194 East Water street.

Portland, Ore.—Williams & Gibson are installing plumbing in a building for Scott Bros., at 342 North Sixteenth street.

Portland, Ore.—The DeTemple Plumbing Co. has been awarded the plumbing contract for a large residence for Dr. A. J. Geisy at 325 Montgomery Drive.

Portland, Ore.—Fox & Co. are now making the plumbing installation in Dr. Holbrook's residence at 130 Maywood Drive.

Portland, Ore.—Fred McClean has been awarded two residence contracts for plumbing in houses for Bert Jarvis located at 492 and 495 East Twenty-ninth street, and also in a house for R. St. James at 1484 Chesapeake avenue.

Seattle, Wash.—The Walsby Construction Co., which is building a warehouse for the A. L. Palmer Investment Co., has announced that the plumbing and heating award has been made to E. M. Harthrong.

Seattle, Wash.—I. G. Navarre will make the plumbing installation in the automobile building now under construction at Harrison street and Westlake avenue, for Thieme, Morris, Hansen & Rowland.

Wisconsin Rapids, Wis.—J. E. Farley has been awarded the plumbing contract for a paint factory and store building. Mr. Farley has also been awarded the plumbing contract for a large machine shop and garage building.

Salem, Ore.—Sturgis & Sturgis of Portland will do the plumbing and heating work on the $125,000 First Presbyterian Church now under way.

Portland, Ore.—Fox & Co. are working on three attractive contracts. One for the Boston Investment Co. comprises the installation of plumbing and heating in the residence being erected at Luray Circus. Another contract is in a building at 606 Killingsworth avenue for R. Hollingshead, and the third in a structure for the Western Investment Co. at West Twenty-fifth street and Harbor Line.

Portland, Ore.—W. K. Dresser is installing plumbing in a new building at 48 East Baldwin for Earl Seamster.

Janesville, Wis.—P. B. Korst has been awarded the heating and plumbing contract for a creamery building under construction here.

Wausau, Wis.—The Central Plumbing & Heating Co. has been awarded the plumbing and heating contract for the Maintenance building now under construction.

Madison, Wis.—C. A. Hooper & Son have been awarded the heating and plumbing contract for the store building under construction here.

Wausau, Wis.—The Wausau Plumbing & Heating Co. has been awarded the plumbing contract for the chapel addition under construction here.

Oshkosh, Wis.—The F. Engle Heating Co. has been awarded the heating contract, and Mueller Brothers the plumbing contract, for a hospital addition under construction.

Milwaukee, Wis.—Thoma Brothers have been awarded the plumbing contract for the garage under construction at 3200 Wisconsin avenue.

Shorewood, Wis.—The Zentgraf Heating Co. has been awarded the heating contract, and Fred Yops the plumbing contract, for the store and apartment building under construction here.

Wauwatosa, Wis.—Hy Mason of Milwaukee has been awarded the plumbing contract for a store and apartment building under construction here.

Milwaukee, Wis.—Paul Kurth has been awarded a contract to install a heating system in a house at 3801 State street.

Milwaukee, Wis.—A. F. Leitgabel has been awarded a contract to install a heating system at 923 Newhall street.

Milwaukee, Wis.—Edward G. Schroeder has been awarded a contract to install a heating system at 995 Frederick avenue.

Milwaukee, Wis.—A. F. Leitgabel has been awarded a contract to install a heating system at 2930 Cherry street.

Milwaukee, Wis.—The Pflugradt Heating Co. has been awarded a contract to install a heating system in a building at First and Locust streets.

Oshkosh, Wis.—Falk & Geffers have been awarded the plumbing contract for a dry cleaning plant.

Waukesha, Wis.—A. A. Andrews has been awarded the heating and plumbing contract for a store building which is being remodeled.

West Bend, Wis.—The West Bend Hardware Co. has been awarded the plumbing contract for a second-story addition which is being erected to the West Bend Aluminum Co. building.

Sun Prairie, Wis.—The Columbus Heating & Plumbing Co. has been awarded the plumbing contract for a school under construction here. The heating contract has been awarded to the American Foundry & Furnace Co. of Chicago.

Without Draining Boiler!

The Ideal Damper Regulator for Closed Hot Water Systems

TYPE F

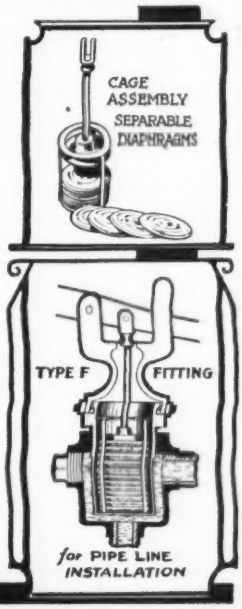
2"

With the "dry well" in place it is never necessary to drain the boiler to inspect or replace parts of a type F

Each Metaphram is a hermetically sealed "wafer" which expands with increase of temperature. Twelve Metaphrams are used in Type F.

Standard equipment on the better boilers.

METAPHRAM DAMPER REGULATOR

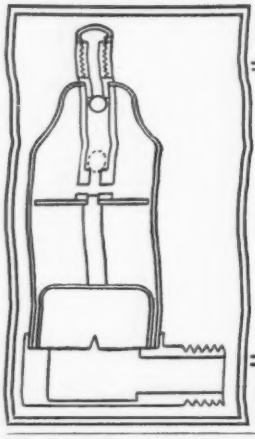


The most powerful and most sensitive of regulators. The Metaphrams operate in a dry well which projects down into the boiler, or in Special Fitting or a Y in pipe line, and is surrounded by water. Slight change in temperature affects Metaphrams, *which operate lever. Gradual action—powerful but sensitive.*

Make your installation complete, more satisfactory and more profitable. Use type F on new or old jobs. Order from your jobber or direct.

NATIONAL REGULATOR CO.
2301 KNOX AVENUE CHICAGO
Manufacturers of the National System of Automatic Temperature Control

METAPHRAM



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We're quite willing—in fact, we want you to be the judge of the fine quality of Donnelly Fitter Automatic Vacuum Air Valve—

That's why we offer you the opportunity to put the Fitter on sale on free trial to your customers—

An absolutely unconditional guarantee goes with the Fitter.

WRITE US ABOUT OR ASK YOUR JOBBER

DONNELLY MFG. CO.
Malden, Mass.

Fitter Air Valve

KNOTT SEATS

Dependable quality plus incomparable appearance are features to be found as major factors in Knott Toilet Seats. Knott experience and reputation back every seat manufactured in our plant.

Do a better job—
use Knott Seats.

Seat No. 1—Hinge No. 70

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Don't Be Content
With ordinary Roof Flashings

Specify and Use the Reliable

"SIMPLEX"
Made in
All Lead—Copper—Galvanized Iron

Every Flashing Adjustable
Every Flashing Perfect

Manufactured only by

SIMPLEX MFG. COMPANY, 213 W. Austin Ave., Chicago

SHER-WHITE

Porcelain Enameled Wash Tray Covers are a sure, easy way to extra profits. Suggest them to the housewife.

Ask your jobber

SHOE-LETCHER COMPANY
10th & Henderson Sts Jersey City, N. J.

Madison, Wis.—W. J. Hyland has been awarded the plumbing contract for a $90,000 apartment building now under construction.

New London, Wis.—The Scholtz Heating Co. has been awarded the heating and plumbing contract for the hospital addition under construction here.

Elkhorn, Wis.—*Magill* Brothers have been awarded the plumbing contract, and the American Foundry & Furnace Co. of Chicago, the heating and ventilating contract for the new theater.

Burlingame, Calif.—Philip Wesendunk, 11 Clement street, San Francisco, was awarded the contract for plumbing on the two-story, concrete store and apartment building under construction in this city.

San Francisco, Calif.—The Dowd & Welch Co., 3558 Sixteenth street, secured the plumbing contract on the new concrete factory building to go up on Sixth street, near Brannan.

Berkeley, Calif.—Coveney & Ehret have been awarded the plumbing contract on a reinforced concrete garage and auto sales building to be erected at Addison and Oxford streets.

San Francisco, Calif.—J. J. McLeod, 1246 Golden Gate avenue, has secured the plumbing contract on the large new residence going up at Eighteenth avenue and Lake street.

St. Louis, Mo.—The Maier Plumbing Co., 3652 Gravois street, has the plumbing contract for the erection of a new church at Mardel street near Kingshighway for the Holy Ghost Evangelical Church.

St. Louis, Mo.—The plumbing contract has been let to the C. J. Moynihan Plumbing & Heating Co., 4974 Northland avenue, in the erection of three apartments at 3048 to 58 Fair avenue.

Meridian, Miss.—Kohler & Douglas were successful bidders for the plumbing contract in the erection of a new residence at Twenty-sixth avenue and Twenty-third street, for Dr. Lowry Rush.

El Dorado, Ark.—The El Dorado Plumbing Co. has been awarded the approximately $50,000 plumbing contract in the erection of the new courthouse.

Jackson, Miss.—The plumbing contract has been let to J. L. Gwin in the erection of the new residence for White Broadway.

New Orleans, La.—Sciambra & Masino, 636 North Broad street, have the $178,238 plumbing and heating contract in the erection of the 18-story addition to the Jung Hotel on Canal and Howard streets.

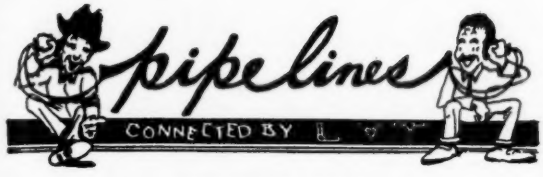
Baltimore, Md.—William A. Imbach & Sons, 1101 Pennsylvania avenue, have the heating and plumbing contract for the residence for Carey W. Lindsay, 2104 Park avenue.

Shawnee, Okla.—The Warren-Smith Hardware Co., with a bid of $14,500, was the successful bidder for the heating and plumbing contract in the erection of the $200,000 State National Bank building.

Tulsa, Okla.—J. L. Heath Plumbing & Heating Co., 415 South Konosah street, has the plumbing and heating contract in the erection of the Oklahoma Natural Gas Co. office building.

Columbia, S. C.—The plumbing contract has been let to W. B. Guimarin & Co., 1224 Sumter street, in the erection of the $100,000 Washington Street Methodist Church Sunday school building.

Knoxville, Tenn.—The plumbing contract has been let to the Engert-Long Plumbing Co., 604 Asylum avenue, in the remodeling of the building at 415-17 Gay street. McGinn & Reiche, 411 West Park avenue, have the heating contract.



A CHRISTMAS CAROL

I had a cruel experience last Christmas. I have a friend. I like him a lot, and when he does something for me I want to do something for him.

I was wondering what to get him for Christmas, just about five days before the 25th. So I got hold of a member of his family.

"What'll I give Jim for Christmas?"

"I don't know," was the answer. "He just bought some ties and I think one of them is for you."

So I went that day and bought him a tie. But the next day I had lunch with this member of his family, who expressed the opinion that he'd been mistaken. He thought that Jim had bought me a fine pair of racing skates.

So I went out and bought him a fine pair of gloves for winter wear.

The next day I talked with the member of his family again and he said: "Say, Jim came home last night with a radio set, and I think he's going to give it to you."

So I went out and bought him a very fine smoking jacket, with expensive slippers to match. The whole thing set me back more than you'd think.

And on Christmas I got my usual tie from Jim.

I WISH YOU A MERRY CHRISTMAS

I thank you very kindly,
For you've been good to me,
I wish you health as well as wealth,
And luck abundantly.

I hope Dame Fortune, bless her soul,
Will see her way quite clear,
To bring you peace and joy sublime
Throughout the coming year.

J. T., Logansport, Ind.

A SAD CASE

We've just heard of the sad case of Sandy, who became engaged to a girl. The young lady got so fat that Sandy wanted to break off the engagement. But the girl couldn't get the ring off, so Sandy had to marry her.

FISHING

Willie tried to catch some fish
For his Daddy's dinner dish;
Willie slipped and fell right in
So Daddy went to fish for him.

H. R. K., Laurel Springs, N. J.

A NEW VERSION

Policeman (producing his notebook): "Where doyah think you're drivin'? What's your name?"

Motorist: "Aloysius Alastair Cyprianus."

Policeman (putting his notebook away): "Well, don't let me catch you again."

HAYSCO SPIGOT.

"SY" SEZ

Man (at telephone): "Zander! Zander! Z! Z! No; not C!—ABCDEFGHIJKLMNOPQRSTUVWXY—Z!"

Peter Blotz, a simple gink,
Thinks a cotton gin is a kind of drink.

In the old days the heroine would grab a lantern and a red flannel petticoat and save the limited from being wrecked. But since modern styles the railroads depend more and more upon the semaphore system.

"SY" MARTIN, Owensboro, Ky.

Pipe Lines is going to offer a very substantial prize for the best solution submitted to this question: "What to do with Christmas gift cigars?" Your drawings may be isometric, if you wish—and after smoking a Christmas cigar that's the way things usually look.

L Y T.

Don't Worry use Vinco!

That **Heating** Installation will give you maximum heating service from the start.

It will conserve your profits and speed up the final payment.

VINCO CORRECTS

Priming
Foaming
Surging
Sluggish Steaming
Clicking Pipes
Trembling Gauge
Trembling Damper Regulator
Air Binding
Excessive Fuel Consumption

Stocked by Leading Jobbers

THE VINCO COMPANY, INC.
75 Vesey Street **New York, N. Y.**

The Herman Nelson hiJet Unit Heater

With

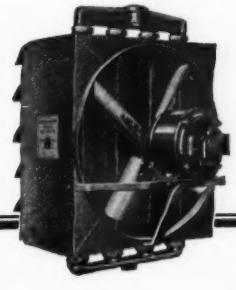
The Wedge Core RADIATOR

Leak-proof, rust-proof, indestructible. Lower installation cost, smaller pipe lines, no reducing valves necessary. Never requires service. Freezing cannot harm it. Operating steam pressure from 1 to 150 lbs Can be suspended from pipe lines or moved from place to place. Long range heat distribution. The ideal heating unit for

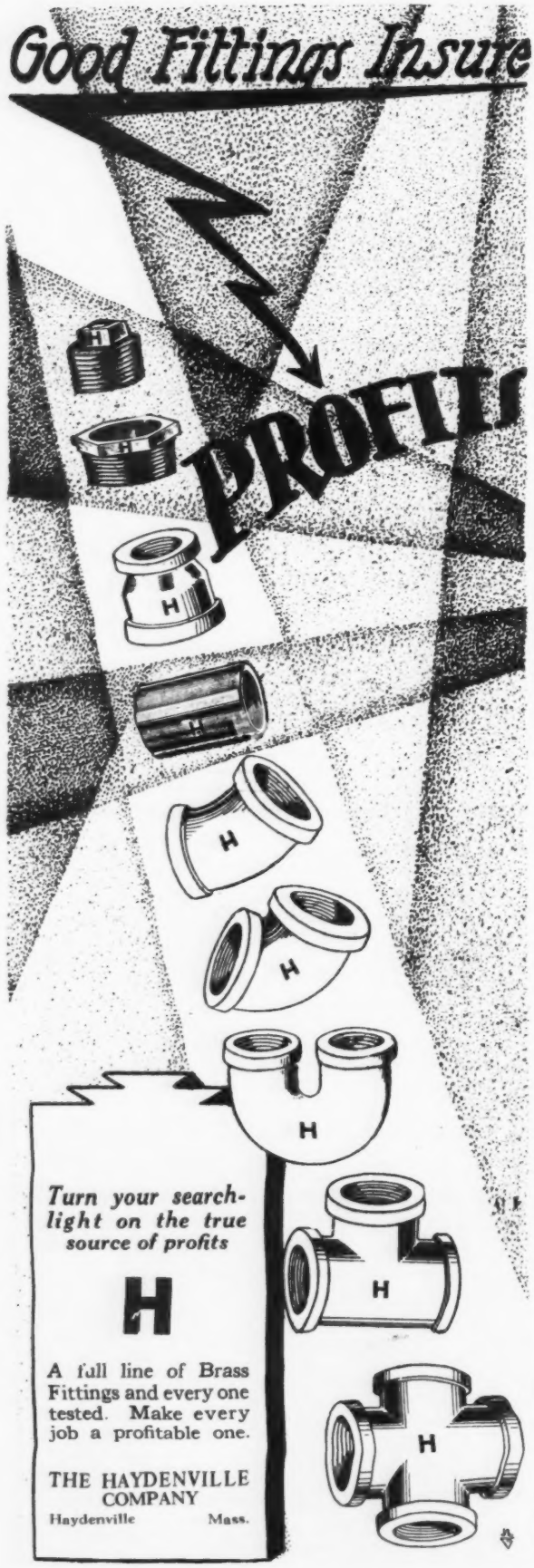
Factories · Mills · Railroad Shops · Roundhouses
Warehouses · Garages · Gymnasiums · Auditoriums

Write for our new catalogue

THE HERMAN NELSON CORPORATION
MOLINE *Makers of the* ILLINOIS
UNIVENT and the HERMAN NELSON INVISIBLE RADIATOR



Write for your copy of the Herman Nelson hiJet Unit Heater catalogue



Bath a Day Movement

Among the various uses to which "The Story of the Bath" has been put, is its use as a Christmas souvenir. Each year a number of alert master plumbers have secured a sufficient number to distribute among their customers. We have just received the first order for this year from Arthur E. Nichols, of Batavia. Following it came one from Fred R. Lawhon, of Arkansas City, Kans., who will use the booklet as a Christmas souvenir. We feel that this booklet will serve far better than many of the novelties which are bought as Christmas souvenirs. It is interesting, it leaves a definite thought behind it, and it serves the master plumber by linking his name with an educational effort.

166

EVERY week we carry at the head of this column the big figures, showing the number of cities and towns in the United States in which "The Story of the Bath" has been distributed to school children for use as supplementary reading.

This was one of the first uses to which the booklet was put, and men who have so distributed it have found it an effective bit of publicity.

Last year the idea of presenting copies of "The Story of the Bath" to members of Rotary, Lions, Kiwanis, Booster and other civic clubs took hold and throughout the country men have written for sufficient copies to give at the luncheons of the clubs to which they belong.

We write these things to show that the Bath a Day Campaign is flexible. It may be used in a number of ways to aid in spreading the gospel of better health through more frequent bathing.

If you have never read "The Story," write us for a copy. You'll find it tremendously interesting, and you'll know then why so many men have been enthusiastic about distributing it.

Epigrams—For Your Use

Some people may be fast asleep, but they are slow when they are awake.

* * *

Hope is the froth on a man's imagination.

* * *

The prettiest bathing suits are always found above the sea level.

* * *

People who pose as practical jokers are apt to joke once too often.

* * *

Women are always trying to learn things they had rather not know.

* * *

Many a train of thought should participate in a head-on collision.

ENTERTAINS EMPLOYES AT DINNER

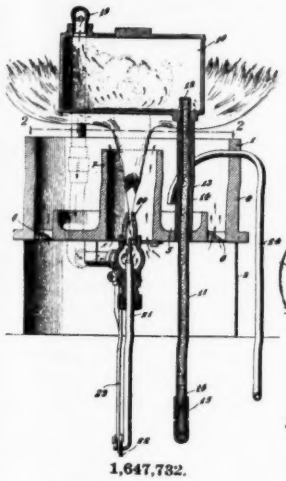
George McVoy, master plumber and heating contractor of Plainfield, N. J., entertained his journeymen and apprentices at a dinner held Tuesday evening, December 6 at Pfaff's Restaurant in Metuchen, N. J. Sam G. Wetzler, president of the Blue Seal Chemical Co., Roselle, N. J., was the speaker of the evening and talked to the assembled plumbers. A number of other guests were in attendance and gave short talks.

Mr. McVoy is at present contemplating an addition to his place of business, including a new showroom.

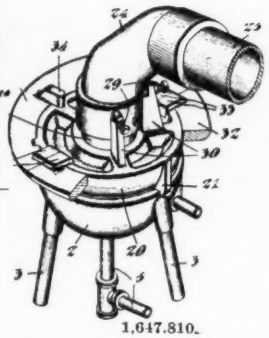
PATENTS

Heating Department

1,647,732. Oil Burner. Robert Andrew Hutchison, Jr., Bridgeton, N. J. An oil burner including a gasifying chamber; an inlet conduit extending partway into the chamber through its bottom; an outlet conduit connected to the top of the chamber; a nozzle connected with the outlet conduit; an air conduit around the nozzle for supplying air to the gasified oil to cause ignition thereof after it reaches the chamber; a laterally extending oil pan around the conduit, and a ring casing spaced from the oil pan forming an air passage for supplying air to the ignited gasified oil to cause complete combustion thereof.



1,647,732.



1,647,810.

1,647,810. Oil Burner. Herbert B. Newhall, Saugus, and Harold R. Underwood, Beverly, Mass. An oil burning apparatus comprising, in combination, a burner bowl, an oil supply pipe leading upwardly into said bowl, an air nozzle leading downwardly and terminating close to the point at which the oil is discharged into said bowl, and means supporting said nozzle for tipping adjustment relatively to said bowl.

* * *

1,642,605. Ventilating System. Orlo G. Crannell, Revere, Mass., assignor of two-fifths to Orlo M. Crannell, Revere, Mass. A ventilating apparatus for closed rooms comprising an outflow conduit for foul air leading from the upper portion of the room directly to the outside atmosphere, a separate inflow conduit for fresh air leading from the atmosphere outside of the room to the interior thereof without communication with said outflow conduit and having an enlarged chamber therein provided with an outlet in its bottom leading to the lower portion of the room, and a refrigerating device contained in said enlarged chamber and operative to dry and cool incoming fresh air to a temperature below that existing in the room, thereby causing the cooled relatively heavier air to flow by gravity downwardly through the outlet in the bottom of said chamber and into the lower portion of the room and thereby causing a corresponding volume of foul air to discharge from the room to the outside atmosphere.

* * *

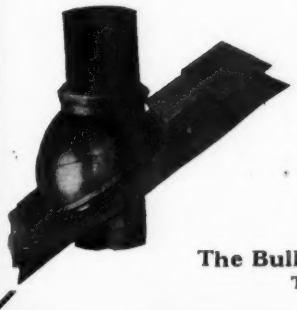
1,643,115. Oil Burner. Edward A. Field and Edward A. Field, Jr., Chicago. The combination in a burner, of an elongated casing open at the top and bottom, a generating chamber open at the top and having a centrally disposed fuel trough at the bottom thereof and wick

The Baltimore Quality Line

PLUMBERS' CAST BRASS GOODS

BALTIMORE VALVE CORPORATION
BALTIMORE, MD.

Bullard Roof Flange



THE absence of solder anywhere in the manufacture or installation of Bullard Roof Flanges eliminates the possibility of leaks from faulty workmanship.

The Bullard Specialty Co.
Tiffin, Ohio

West Park

West Park Handy Fittings and Traps come to you with the unconditional West Park guarantee for perfect materials and workmanship behind them.

The most accurate threading and finest machining, highest grade galvanizing and asphaltum painting make it possible for West Park to back its goods to the utmost.

THE WEST PARK FOUNDRY COMPANY
3560 Norton Road :: Cleveland, Ohio

Handy Fittings and Traps

Hinges of the Better Kind

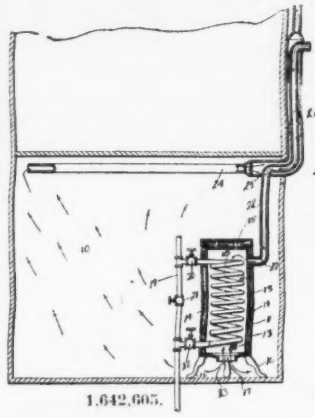
Hinge No. 100 — Close-Ruf

GRAND HAVEN BRASS FOUNDRY
Grand Haven, Michigan

Hinges for all types of toilet seats

All hinges can be furnished Crodon Plated if so desired.

channels at the sides of the fuel trough, said generating chamber being disposed centrally and longitudinally of the casing and in spaced relation to its side walls providing an air inlet passage at the sides of the generating chamber, said fuel trough containing fuel distributing material and said wick channels being provided with wicks, there being an overflow trough at one end of said fuel trough and wick channels, air passage members tiltably mounted on the upper edges of the casing side walls to overhang said air passage and depending within said



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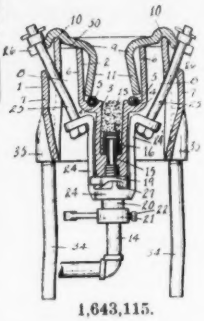
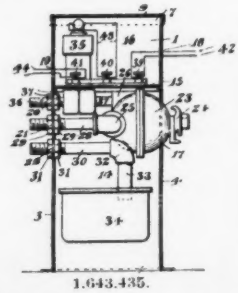


1,643,115.

generating chamber providing return air passages delivering in proximity to said fuel trough, said passage members being adapted to rest on the generating chamber walls when in one position, thereby closing the air passages and exposing the wicks within the mixing chamber, a vertically disposed fuel feed pipe for said fuel trough, a sleeve rotatably mounted on said pipe and provided with a downwardly facing cam, a yoke slidable on said sleeve below said cam to be actuated thereby, and links connecting the arms of said yoke to said passage members.

* * *

1,643,435. Controlling Unit for Oil Burners. Thomas B. Allardice Mountain Lakes, N. J. A controlling unit for the purpose set forth comprising an electrically operated oil feed controlling valve, a terminal block, a manually operated oil supply regulating valve arranged in proximity to said block, positioned below, spaced from and rearwardly of the controlling valve, an oil supply connection



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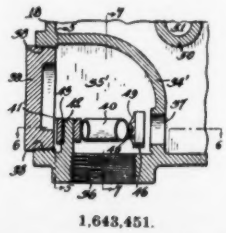

1,643,451.

opening into the inner side of said regulating valve, an oil feed line connection extended from said regulating valve at the top thereof, intersected by said controlling valve and positioned above said supply connection, and a housing common to said valves and having one side common to and providing means for supporting said pipe connections.

* * *

1,643,451. Interior Valve for Radiators. Charles D. Hickman, Philadelphia, Pa. In a radiator, a radiator section having an outlet, walls about the outlet forming a compartment and having a valve-seated opening between

EVERLASTING WHITENESS

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TRIPLE COMBUSTION

Better Boilers

12 Big Reasons Why

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4. *Greatest possible fuel economy.*
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7. *Gases escape at bottom where water is at lowest temperature.*
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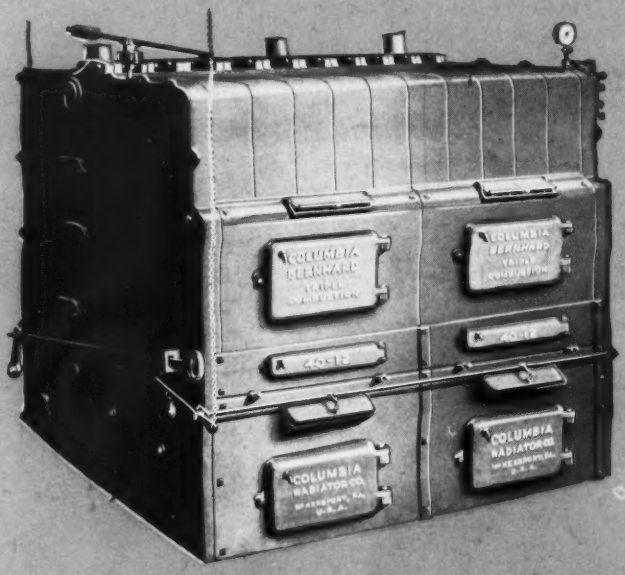

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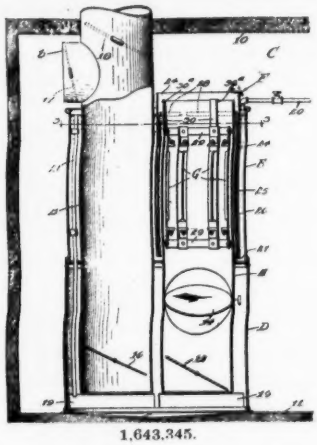
Write for complete catalog on this new line and learn for yourself the profit possibilities of Columbia-Bernhard Triple Combustion Boilers.

COLUMBIA RADIATOR CO. – *McKeesport, Pa.*

the compartment and the interior of the radiator section, and a thermostatic valve mounted within the compartment to close against and open from the valve seat.

* * *

1,643,345. Ventilating, Heating, and Humidifying Apparatus. Charles A. Moore, St. Paul, Minn. The combination with a chamber, of air circulating ducts therein, a tank through which said ducts pass, a member adjacent one of said ducts and forming therewith a restricted space

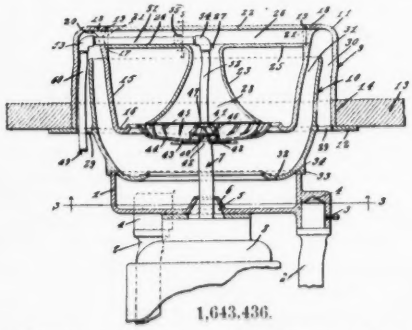


1,643,345.

outside duct through which fluid contained in said tank may circulate, and means arranged to affect the temperature of the air in said duct and also of the fluid about the same.

* * *

1,643,436. Oil Burner. Thomas B. Allardice, Mountain Lakes, N. J. An oil burner comprising an air receiving chamber, a pair of air pre-heating chambers communicating with said air receiving chamber, one of said air preheating chambers, arranged within the other and of bell-shaped contour, a rotary impeller for vaporizing oil arranged below and in close proximity to the lower end of



1,643,436.

said bell-shaped chamber, a distributor head rotating with said impeller and provided with ports for distributing oil in jet like form upon the impeller, said impeller receiving pre-heated air from said bell-shaped chamber to facilitate the vaporizing of the oil, and means to provide for the passage of pre-heated air from the other of said air heating chambers to admit with the oil vapor and air on the discharge of the same from the impeller for combustion.

* * *

1,643,889. Fuel Burner. William J. Haddock, Baxter Springs, Kans. As a new product of manufacture, a fuel burner of the class described comprising an outer cylinder closed at one end, and merging at its opposite end into a slightly enlarged burner head, a partition wall on the interior of said cylinder and located at its point of con-

Just the proper thing for the Gas Heated Garage

THE

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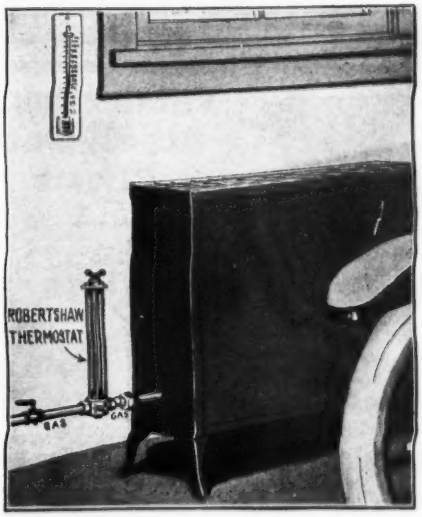

Showing a Typical Installation of the Robertshaw Throttling Type Garage Heater Thermostat

The Uniform Temperature of the Garage affords many advantages that the Car owner will readily appreciate. First of all, it makes a comfortable workroom, the car starts easily, no danger of freezing the Radiator or Battery, no cracked cylinders, no clogged oil pipes, and the uniformity of temperature preserves paint and tires, and saves gas by using no more than is actually required to maintain the desired temperature.

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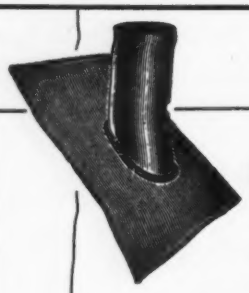

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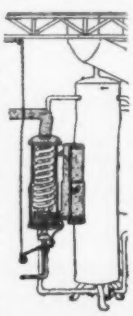
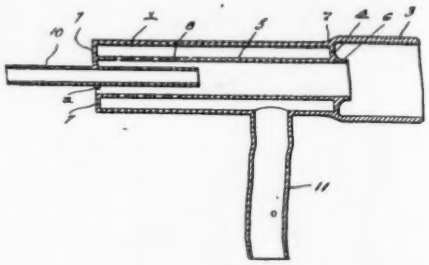


nection with said burner head, an inner cylinder of a diameter less than the outer cylinder and located within the latter, and connected with the closed end of the outer cylinder, and extending through and beyond the center of said partition walls, terminating within the area of said *burner head, said inner cylinder being* provided at the

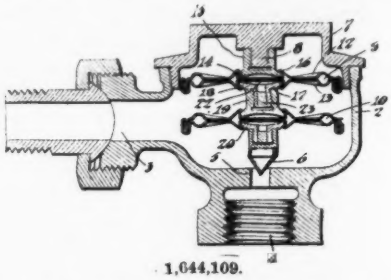


1,643,889.

first named end with a multiplicity of fuel intake ports, radially disposed spider arms in the last open end of said inner cylinder, an air supply pipe connected with said spider arms and extending into the interior of the inner cylinder and beyond the innermost fuel ports, a right angularly disposed fuel intake pipe connected with the intermediate portion of the outer cylinder, and a supporting leg connected with the closed end of said outer cylinder.

* * *

1,644,109. Water and Air Relief Valve. William D. Cashin, West Roxbury, and Max P. Miller, Waban, Mass., assignors to W. D. Cashin Co., Boston, Mass. In a thermostatic valve, the combination of an expansible metal container for volatile fluids comprising a flexible metal disk,



1,644,109.

a stud having a head of approximately conical form bear*ing against the central portion of said disk,* said disk having an annular flange folded over and pressed against the tapered surface of said head and being radially ribbed between said flange and its margin, and a second metal disk cooperating with the first disk, the outer margin of both disks being folded together.

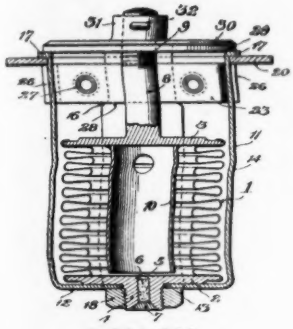
* * *

1,644,325. Thermostatically-Controlled Valve Mechanism. William W. Carson, Jr., Knoxville, Tenn., assignor to The Fulton Sylphon Company, Knoxville, Tenn. In a device of the character described, in combination with a thermostat and a valve member operatively connected thereto, a valve seat ring provided with projections, and a support for said thermostat engaging said projections and co-operating therewith to provide a valve seat for said valve member.

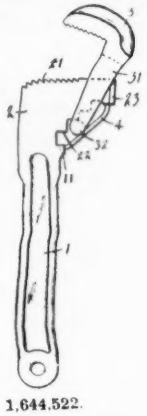
* * *

1,644,522. Pipe Wrench. Charles J. Harris, Hartford, Mich., assignor of one-half to Charles M. Duncombe, Hartford, Mich. In a pivoted jaw wrench, the combination of a handle with a suitable laterally projecting fixed jaw head integral therewith and serrated on its outer face and having notches on its under side for adjustment and

lateral lugs at its projecting extremity, a pivoted jaw slotted to pass over the said handle onto the said jaw head with a pivot at the lower end of the slot to engage the



1,644,325

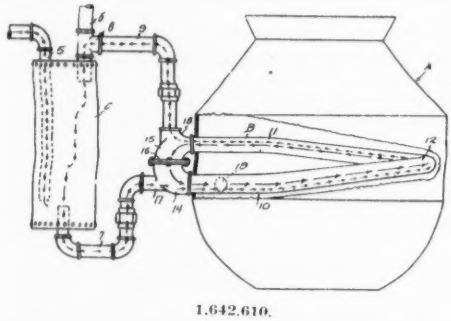


1,644,522.

notches successively, and a spring rod pivoted in the lateral projection of said jaw and adapted to detachably engage a suitable notch for retaining the said pivoted jaw adjustably in position, as specified.

Plumbing Department

1,642,610. Apparatus for Preventing Incrustation of Water Coils. Edward I. Ingles, Indianapolis Ind. The combination with a hot water heater including a coil having its outlet and its inlet arranged substantially in the same vertical plane, vertically arranged fittings connected to each other and to the inlet and the outlet, a supply for



1,642,610.

cold water connected with the lower end of the fittings, and an outlet pipe for the warm water connected with the upper end of the fittings, of a ball arranged in the coil and adapted to travel by the circulation of water therethrough from the lowermost point of the coil to the uppermost part of the coil and return by gravity to the lowermost point of the coil when the same reaches the fittings.

* * *

1,642,264. Indicating Means for Faucets or the Like. Frederick Pilkington, New York, N. Y. The combination of a movable member, an actuating member therefor, and means for securing said members together, with a base member secured in position by the securing means for said actuating member, and an index member attached to said base member and serving to cover said securing means substantially as specified.

* * *

1,643,223. Water-Heating System. Henry W. O'Dowd, Jersey City, N. J., assignor to Standard Gas Equipment Corporation. In a water heating system, the combination of a storage tank, a circulating pipe leading from and to the tank and including a water-heating unit, and compris-

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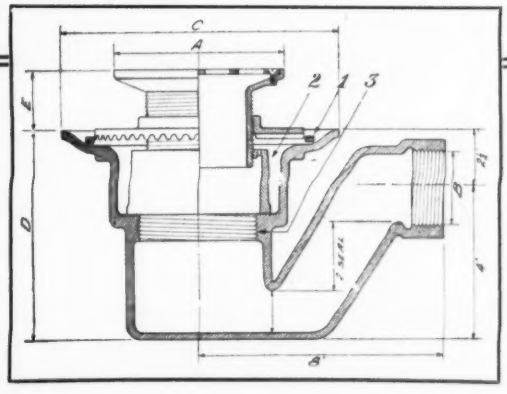
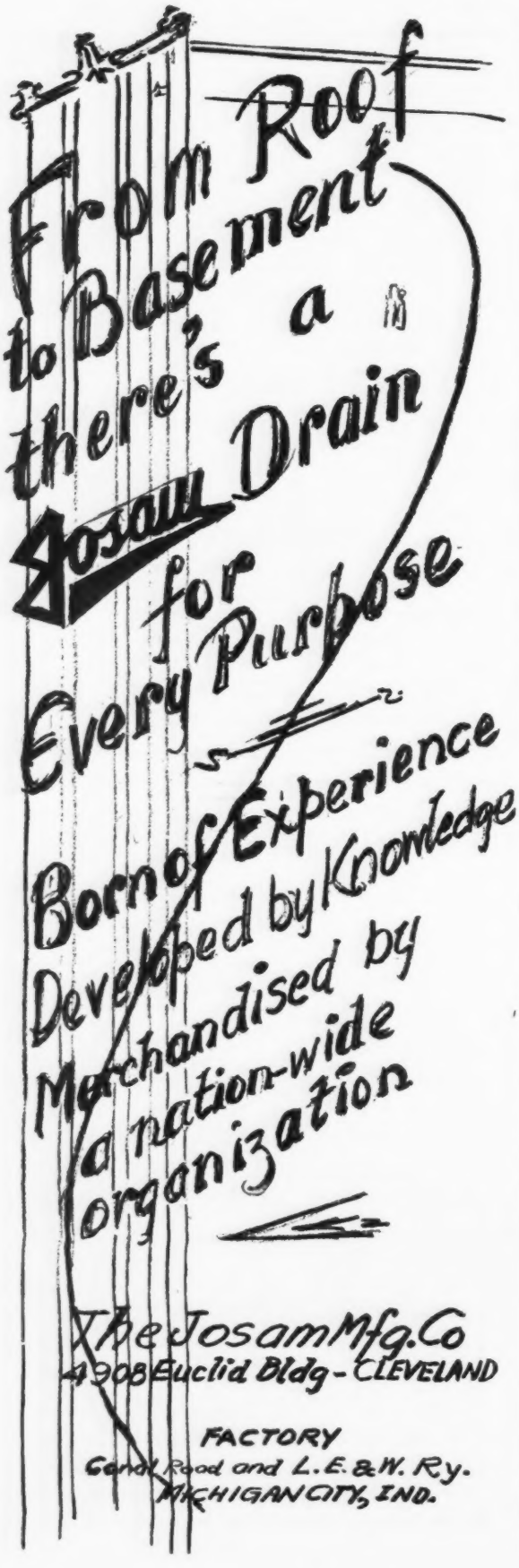
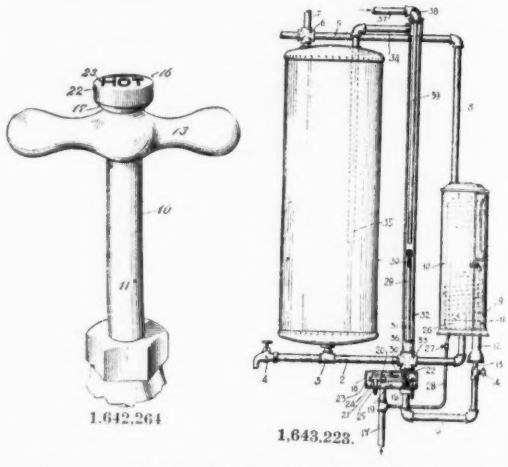




ing a flow pipe leading from the heating unit to the tank and a return pipe leading from the tank to the heating unit, a heating appliance associated with said unit, a thermostat controlling the action of the heating appliance,



1,642,264 1,643,223.

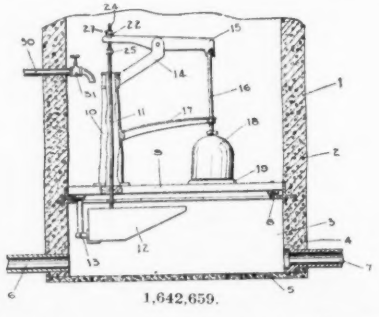
and a pipe containing the thermostat and communicating at its lower end with the bottom portion of the tank and provided at its other end with a branch pipe independent of the said flow pipe and extending downwardly into the tank to a predetermined level below the top of the same.

* * *

1,642,594. Process of Treating Hard Water. Grigori Petroff, Moscow, Russia, and Peter Shestakoff, Paris, France. In the process of softening hard water, the step which comprises treating the water with high molecular weight sulphonic acids.

* * *

1,642,659. Automatic Sewer Flusher. Charles R. Lion, Los Angeles, Calif. In an automatic sewer flusher having



1,642,659.

a flushing column, a pan, a pan rod extending through the column connected to said pan, a lever operatively connected to a valve bell, and an adjustable swiveling connection between the pan rod and the lever.

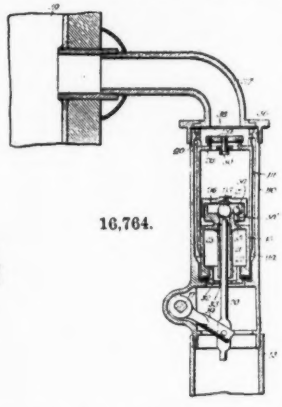
* * *

1,643,638. Waste-Pipe Tool. Charles E. Dunham, Los Angeles, Calif. A waste-pipe tool consisting of a body transversely slotted at one end, a pair of oppositely located fingers in said slot which are pivoted near their upper ends to the body, and there being a laterally projecting ear on each finger with the lower end thereof substantially conterminous with the bottom of the body and with the upper edge of each ear inclined upwardly and inwardly, and a spring between said fingers for normally forcing them away from each other.

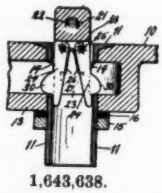
* * *

16,764. Flushing Valve. William Sears White, Denver, Colo. In a flush valve mechanism having a fluid inlet port and a fluid outlet port and a connecting passageway, a fluid storage chamber adjacent said passageway, a valve

between said chamber and passageway for controlling communication between said inlet and outlet ports, said valve having an auxiliary chamber therein and an orifice communicating between said auxiliary chamber and said storage chamber and a second orifice communicating be-



16,764.

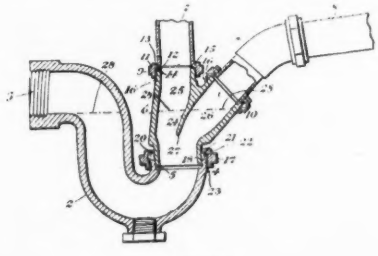


1,643,638.

tween said auxiliary chamber and said passageway, gravity operated means normally closing one and substantially closing the other of said orifices, and manually operable means for displacing the means closing the second said orifice for opening the same.

* * *

16,752. Drain Trap. George D. Casper, New York, N. Y., assignor of one-half to William W. Schusky, Long Island City, N. Y. A self-cleaning drain trap having a water seal and embodying a member having an outlet and a juncture portion on the inlet part thereof below the water seal surface, an inlet member having a portion to fit said juncture portion of the first-mentioned member

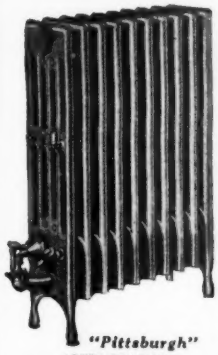


16,752.

and having two pipe connections both above the water seal, joining branch passages separated by a wall that is above said juncture portion and whose lower edge is below the water seal surface whereby the inlet pipes are water-sealed from each other, and in which inlet member the area of the lower orifice thereof exceeds any single cross section of either of said branch passages, and means below the water seal surface whereby the first-mentioned member and the member having said pipe connections are joined together at said juncture portion.

* * *

1,643,500. Flushing Valve. Arthur Jacobson and Alexander L. Ogilvie, San Francisco, Calif. In a flushing valve, a main-piston valve therefor consisting of a cylindrical cast shell having a head and reduced neck portion forming a diaphragm seat, a tapped opening in said head, a clamp-nut having a threaded portion adapted to fit in said tapped opening to clamp the diaphragm to the head, a plurality of discharge openings in the wall of said shell positioned adjacent the head thereof, and said shell being provided with a smooth exterior coating of vulcanized hard rubber extending over the upper and lower edges thereof to bind the same thereto.



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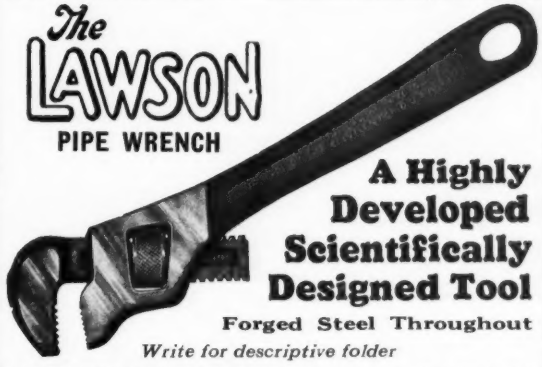

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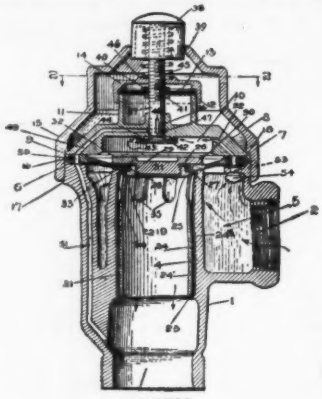
DOMESTIC ENGINEERING
1900 Prairie Ave., Chicago, Illinois

1,643,558. Ball Cock. Charles H. Gunn, San Francisco, Calif. A ball cock including a vertical barrel, an enlarged casing in the top of which the lower end of the



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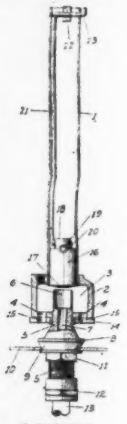
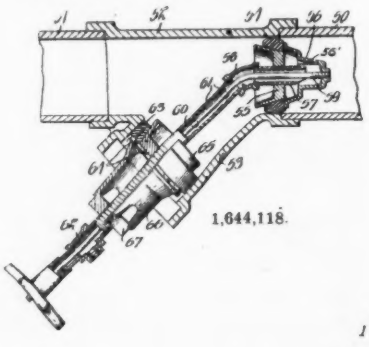


1,643,558.

barrel is fixed, a water intake member projecting upwardly *into the casing in alignment with* the barrel, said member being open at its upper end, and a float controlled plunger in the barrel to engage and close the upper end of said member; the casing having outlets in its bottom.

* * *

1,644,436. Drain-Pipe Cleaner. Arthur Locke, Tacoma, Wash. A device of the class described, comprising an inverted, cup-like member formed of a yieldable, air and water-tight material, the side walls of the cup being formed in a series of annular corrugations and the upper portion of the cup having a socket in its outer face and formed inside the cup with a depending, conically tapered head and a handle fitted into the socket.



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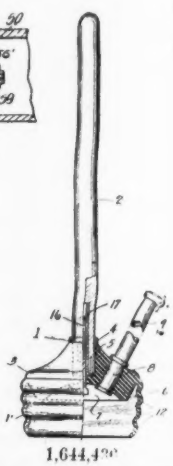

1,644,436.

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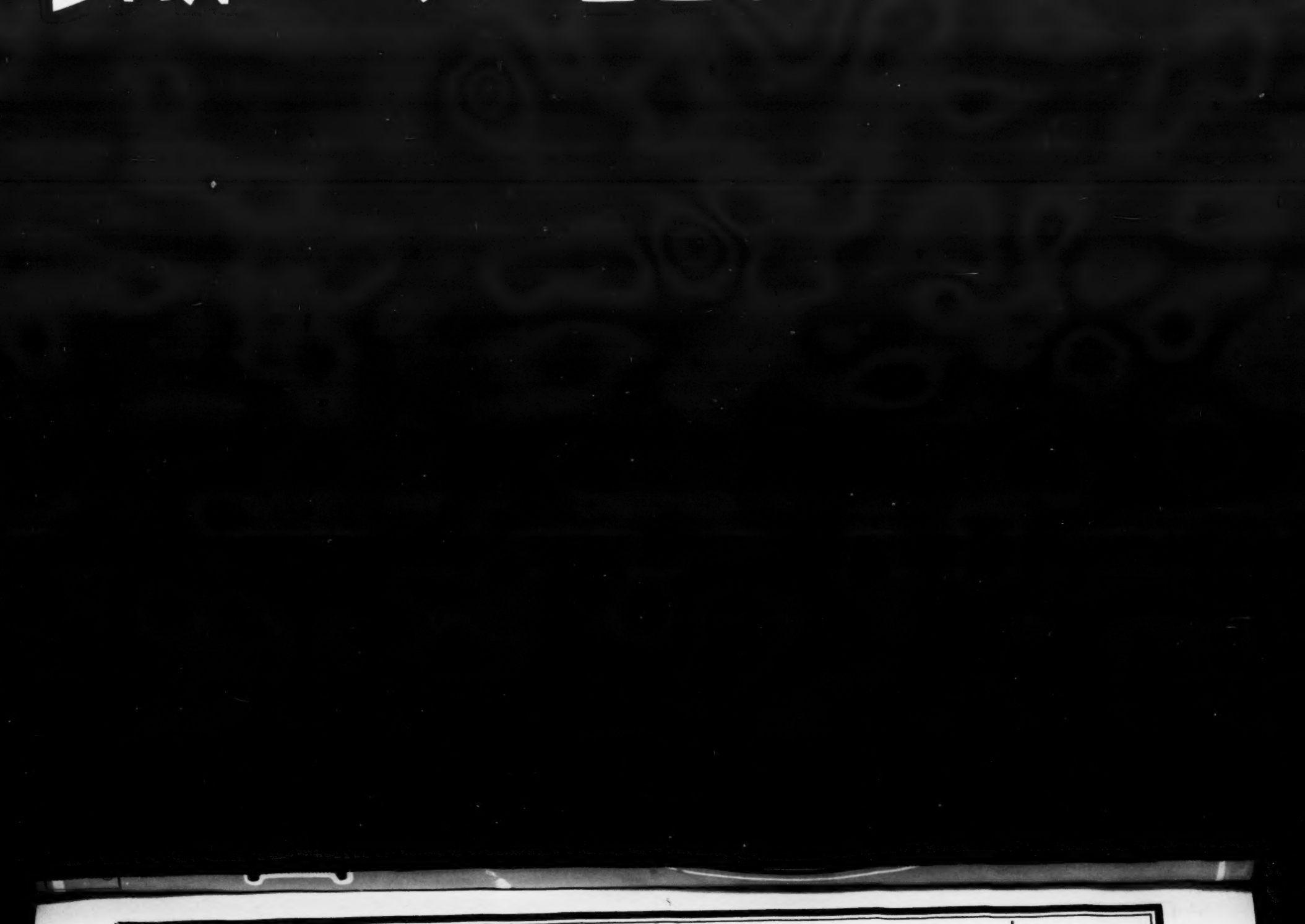
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